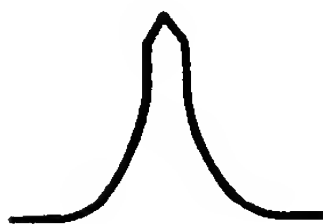




Point Curvature: Large  
Aspect Ratio: Small ( $\div 1$ )

**FIG. 1A PRIOR ART**



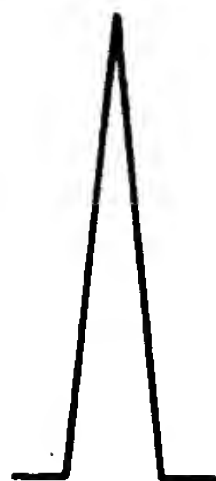
Point Curvature: Little Small  
Aspect Ratio: Small ( $\div 4.5$ )

**FIG. 1B PRIOR ART**



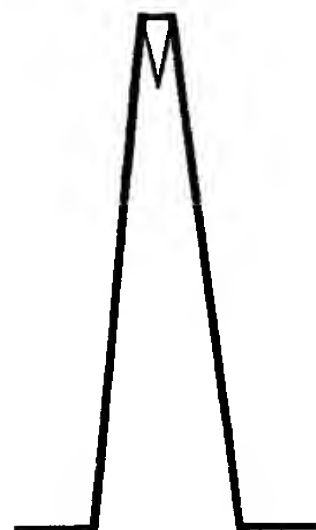
Point Curvature: Little Small  
Aspect Ratio: Small ( $\div 1$ )

**FIG. 1C PRIOR ART**



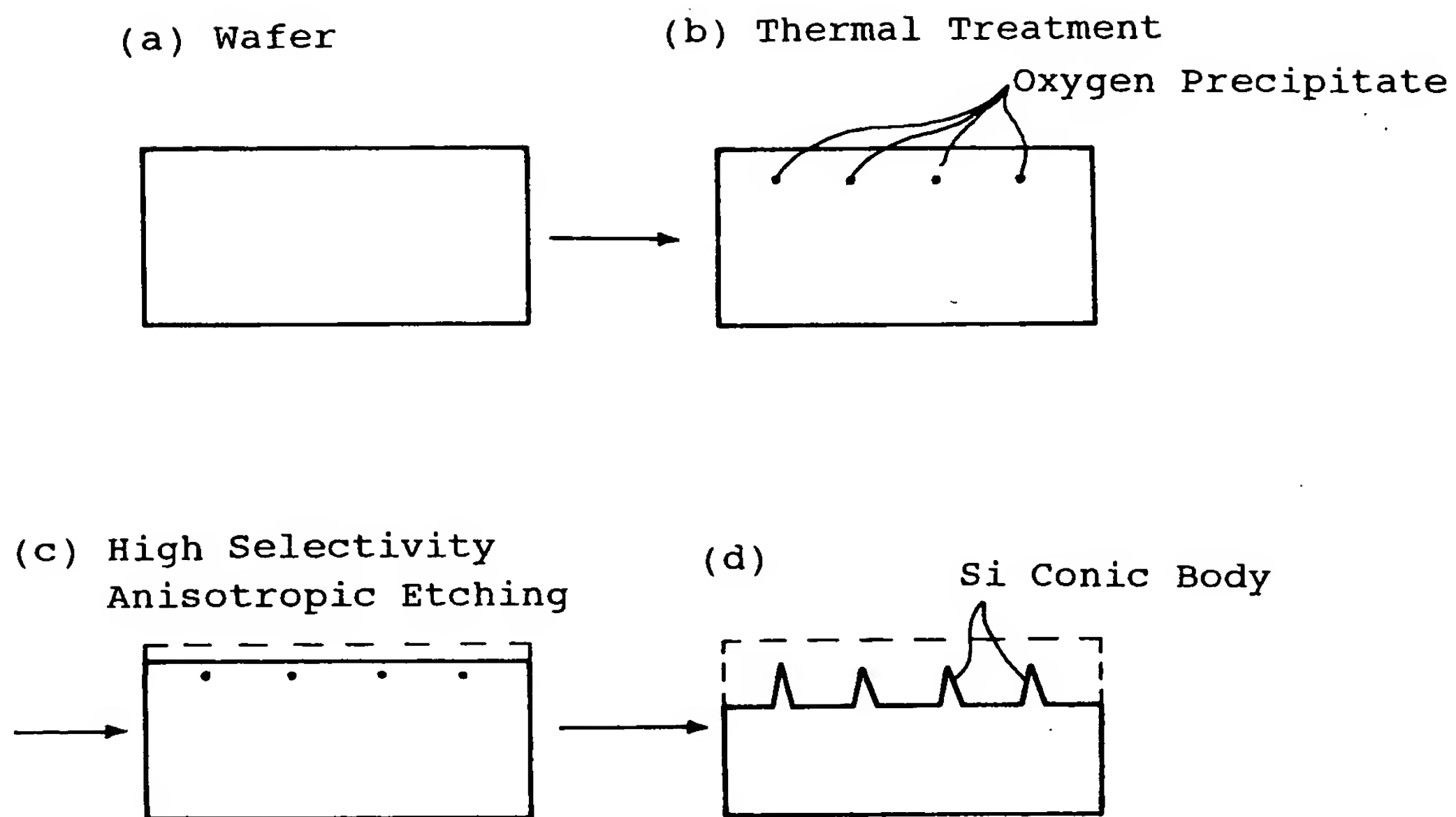
Point Curvature: Small (Several nm)  
Aspect Ratio: Large ( $\approx 10$ )

**FIG. 1D PRESENT INVENTION**



Point Curvature: Small (Several nm)  
Aspect Ratio: Large ( $\approx 10$ )

**FIG. 1E PRESENT INVENTION**



**FIG. 2**

FIG. 3A

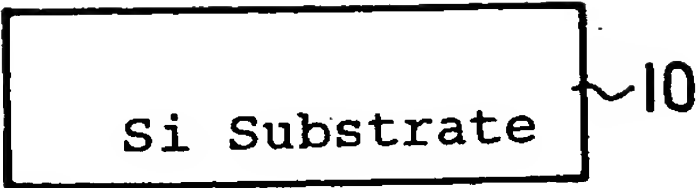


FIG. 3B

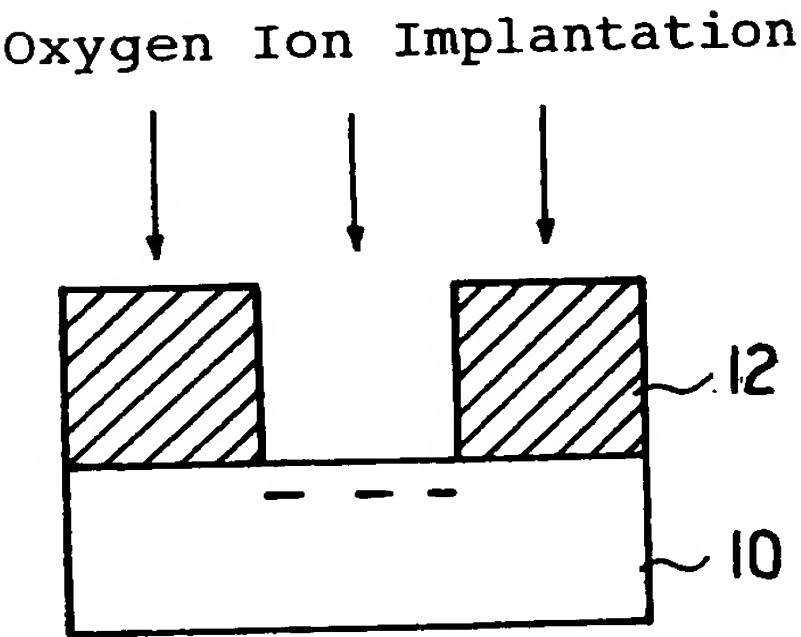


FIG. 3C

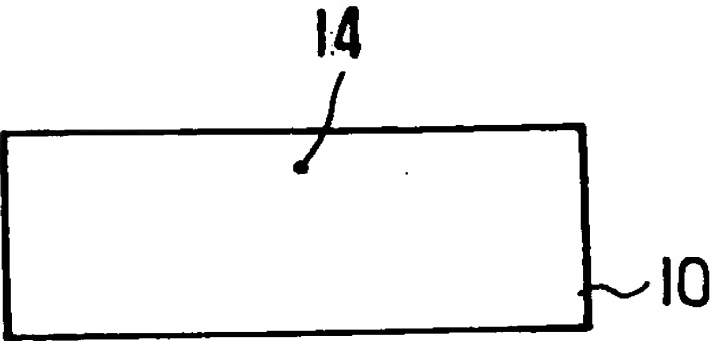
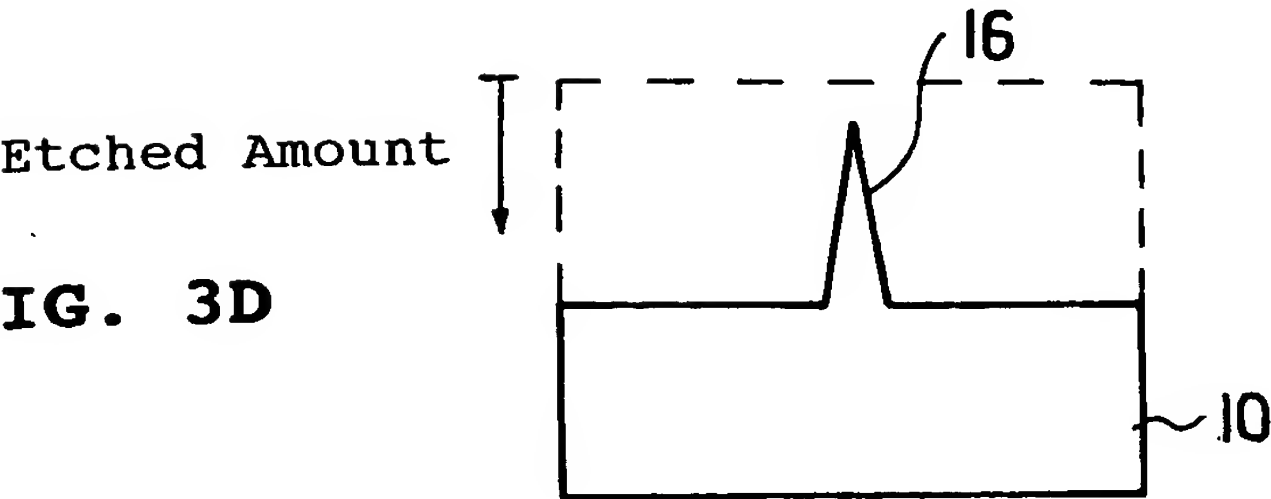


FIG. 3D



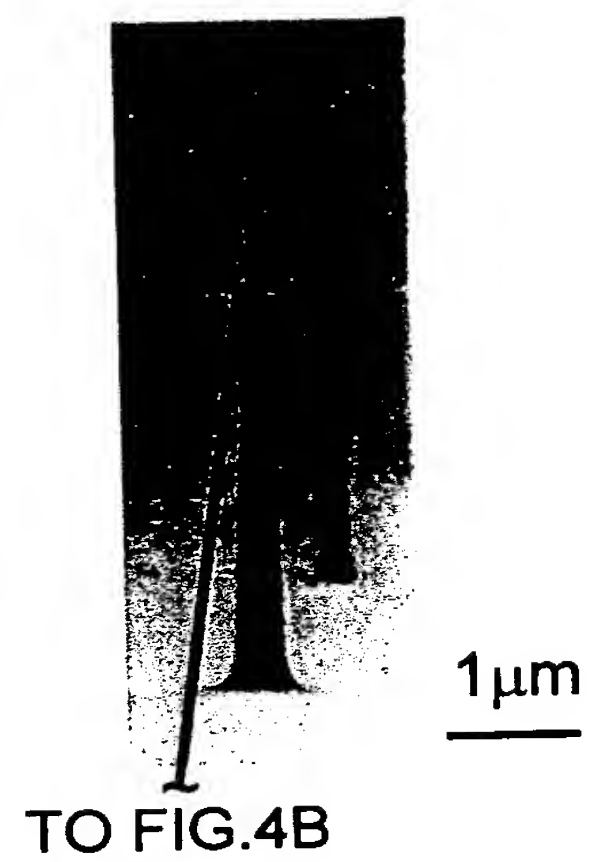


FIG.4A

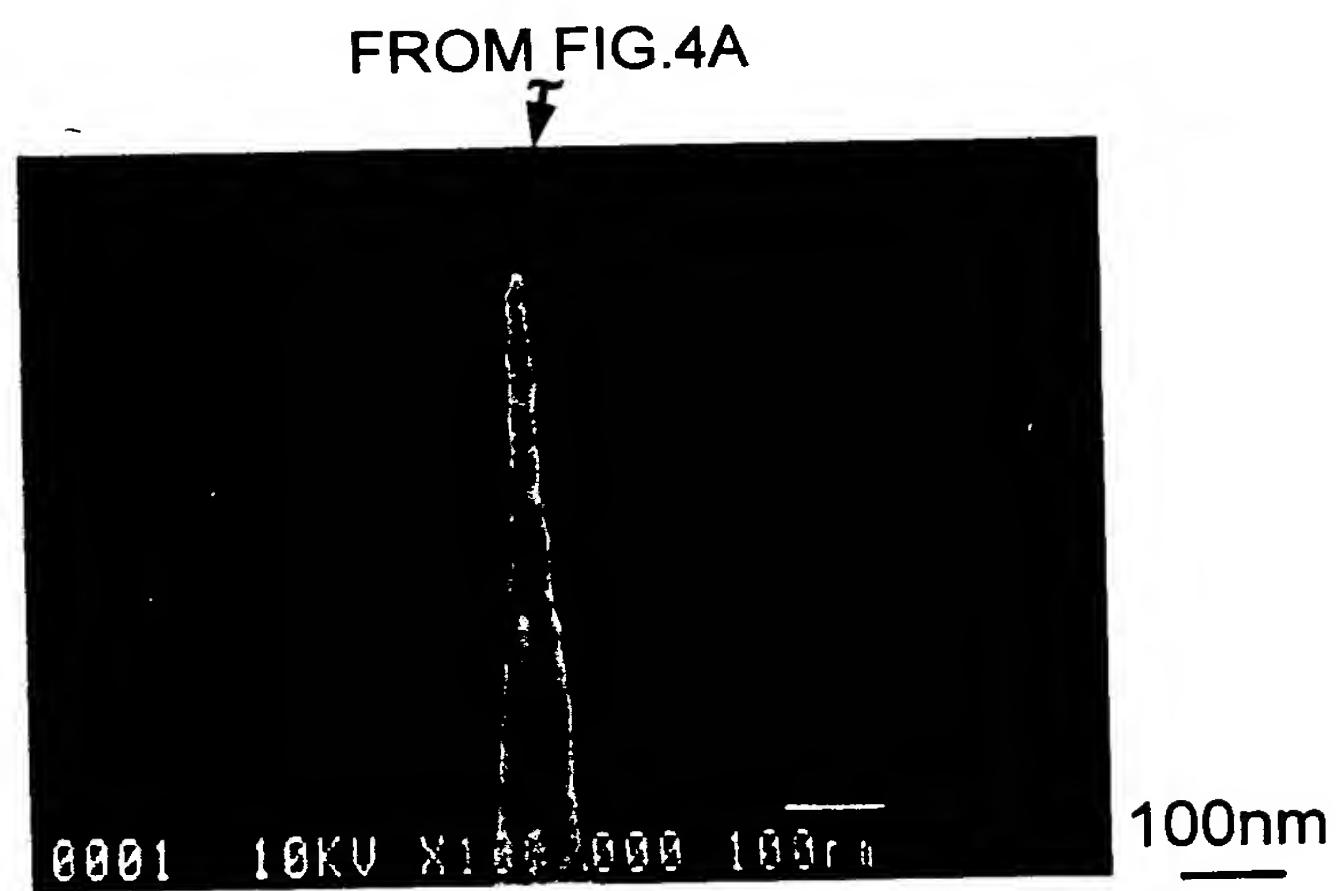
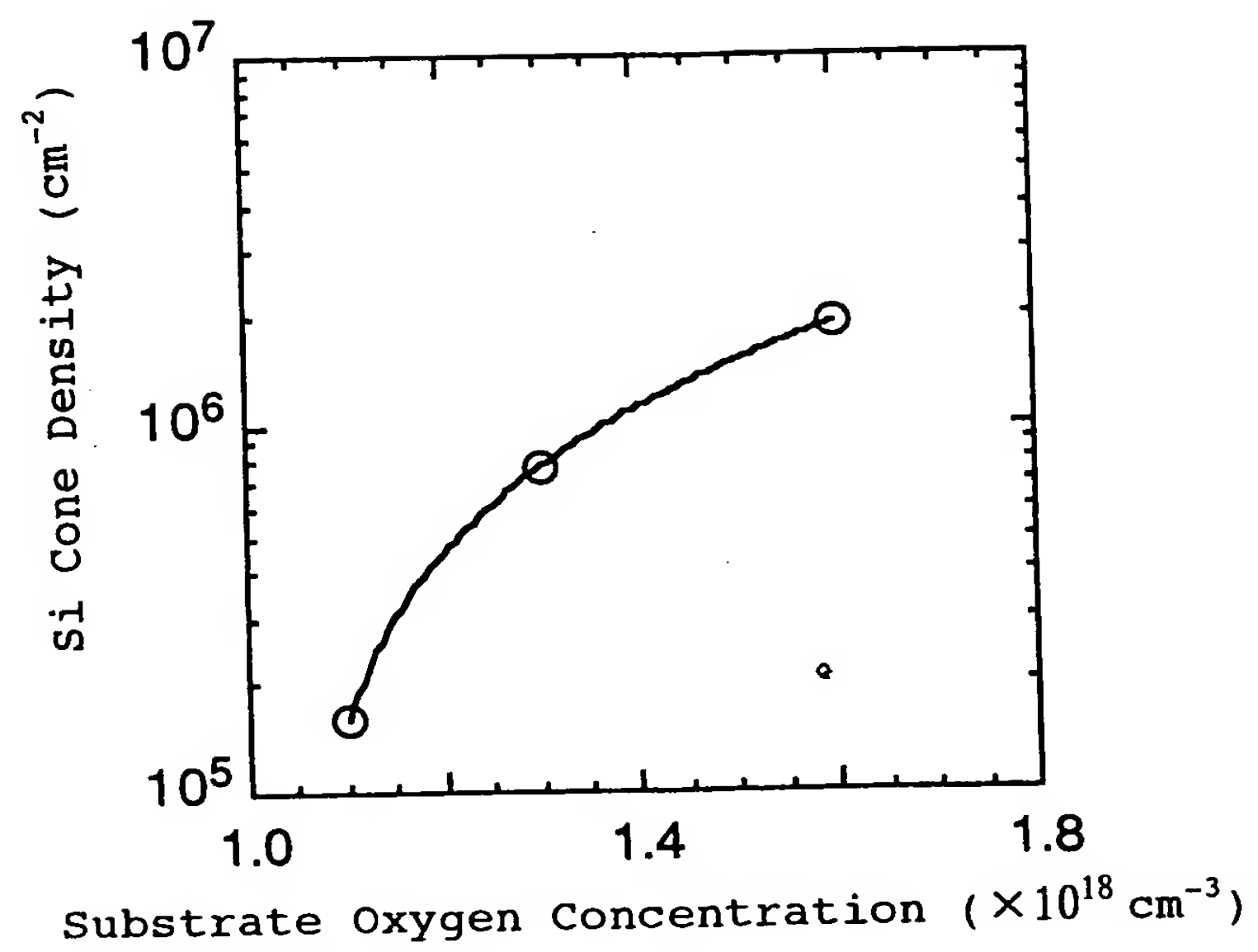


FIG.4B



**FIG. 5**

B Implantation Amount:

$$7 \times 10^{13} \text{ cm}^{-2}$$

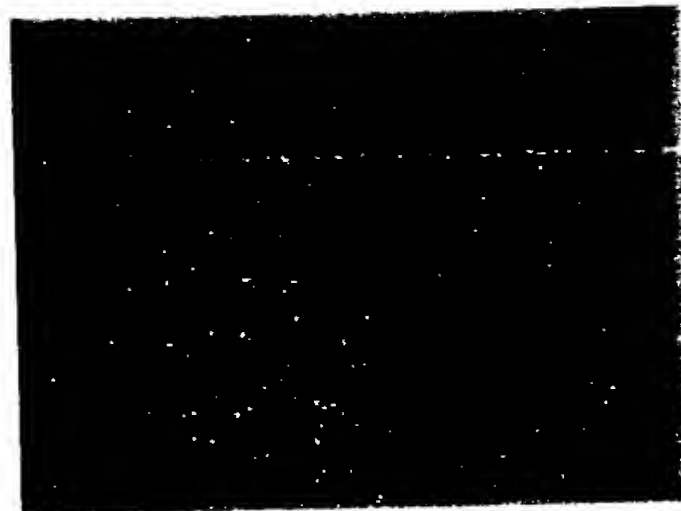


100μm

FIG.6A

B Implantation Amount:

$$1 \times 10^{14} \text{ cm}^{-2}$$

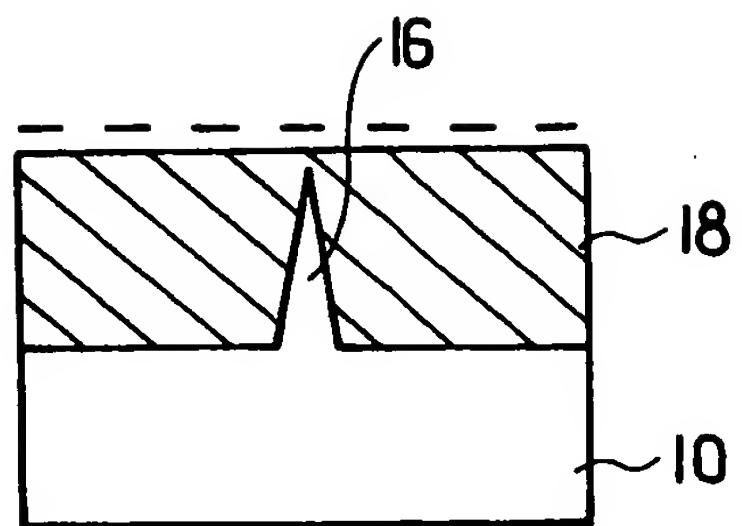


100μm

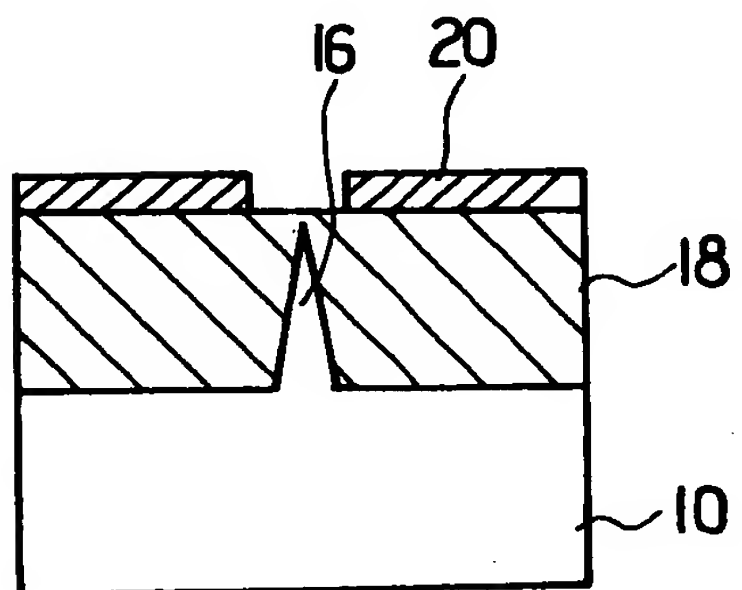
Black dots  
are silicon needle conic bodies.

FIG.6B

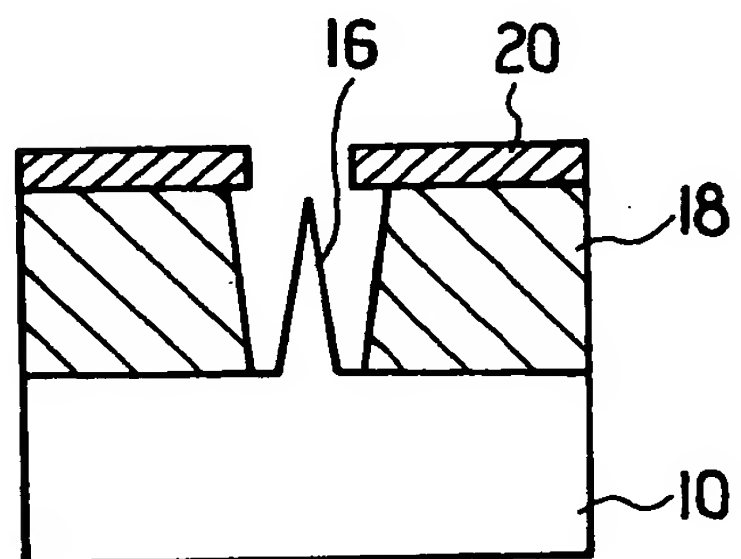
**FIG. 7A**



**FIG. 7B**



**FIG. 7C**





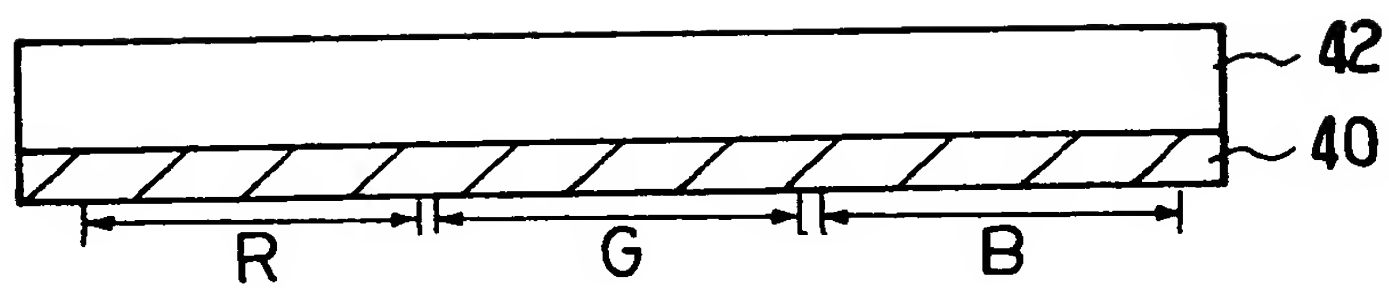


FIG. 8A

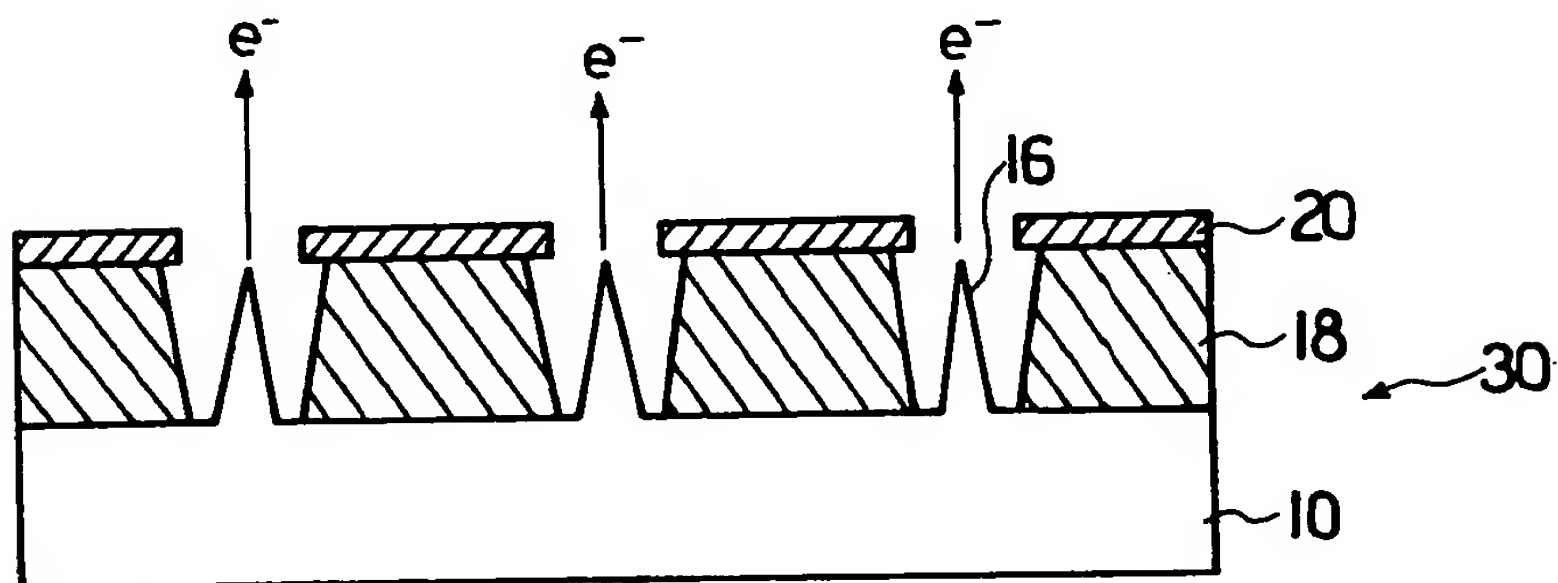
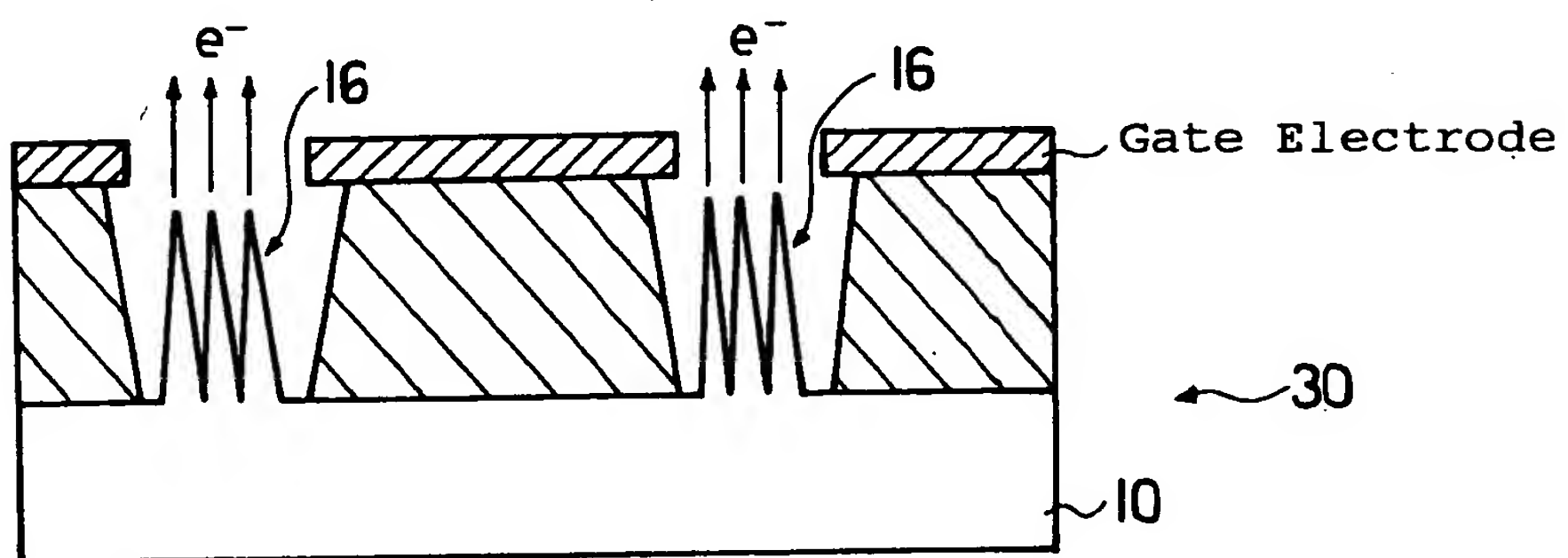
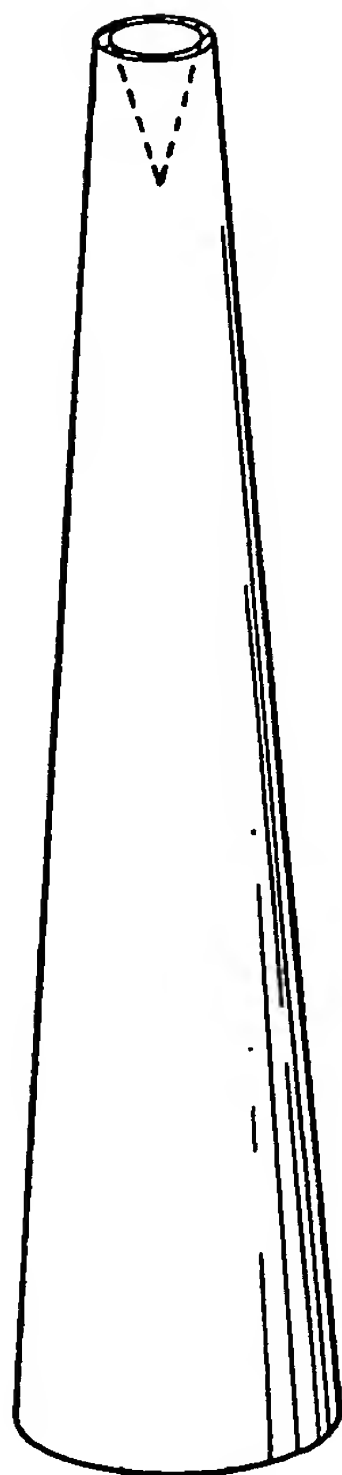
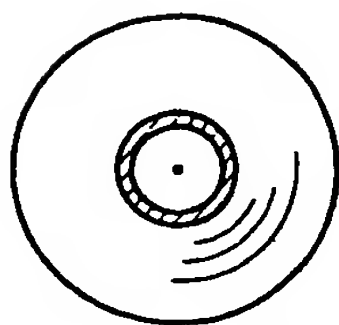


FIG. 8B



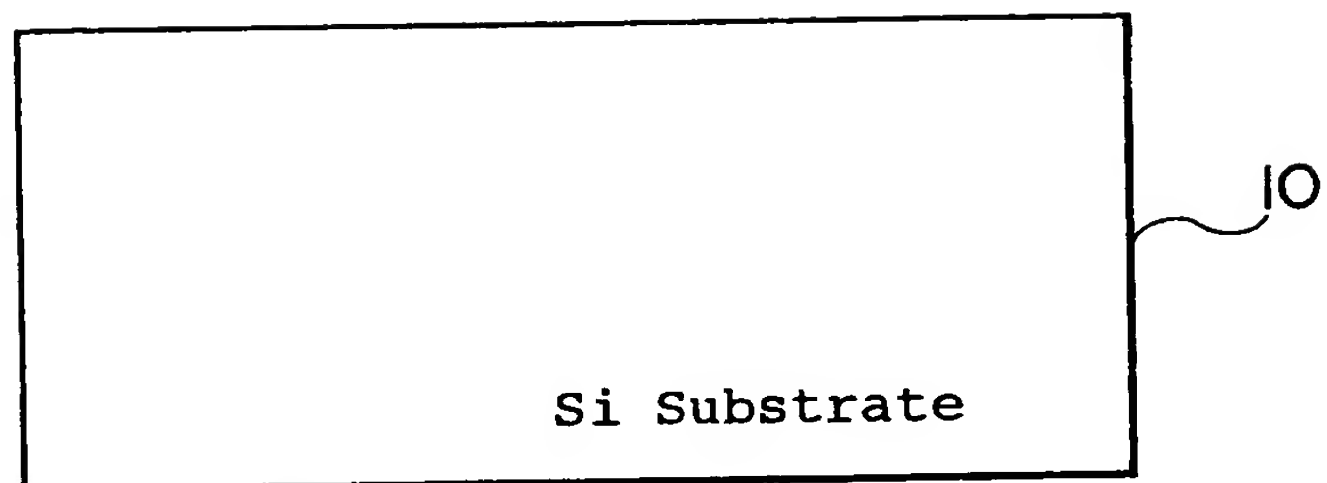


**FIG. 9A**



**FIG. 9B**

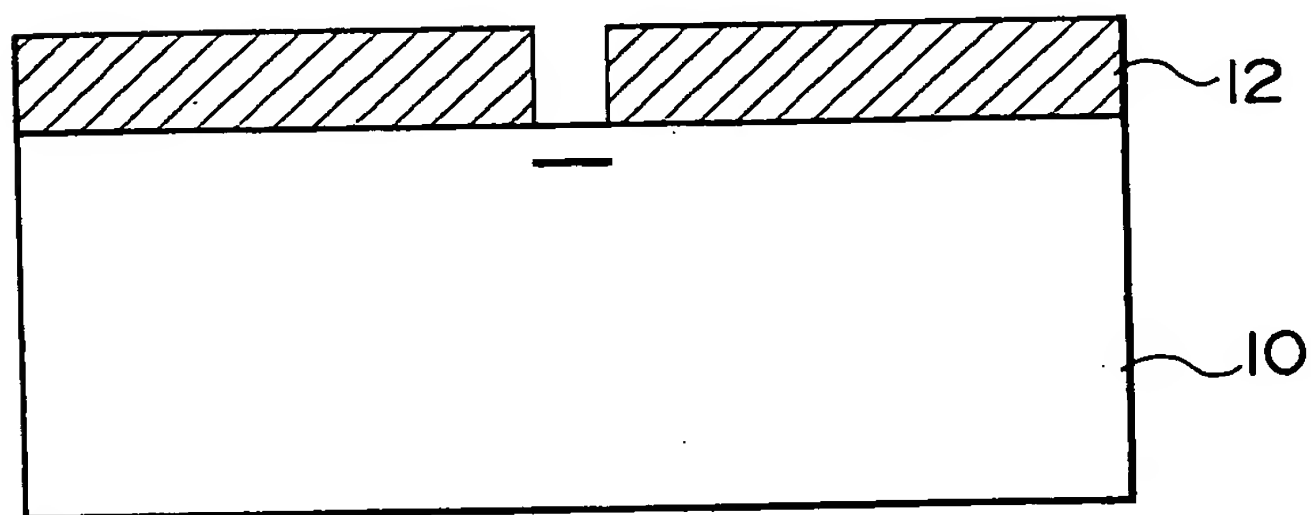
**FIG. 10A**



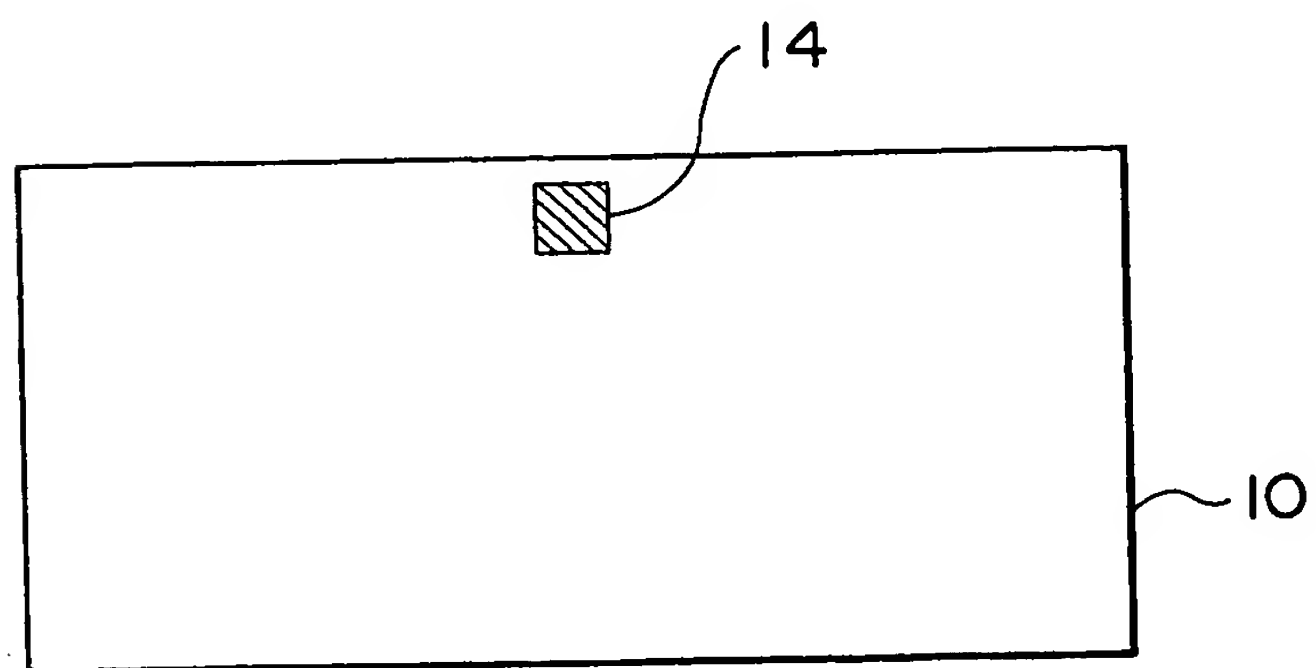
Oxygen Ion Implantation



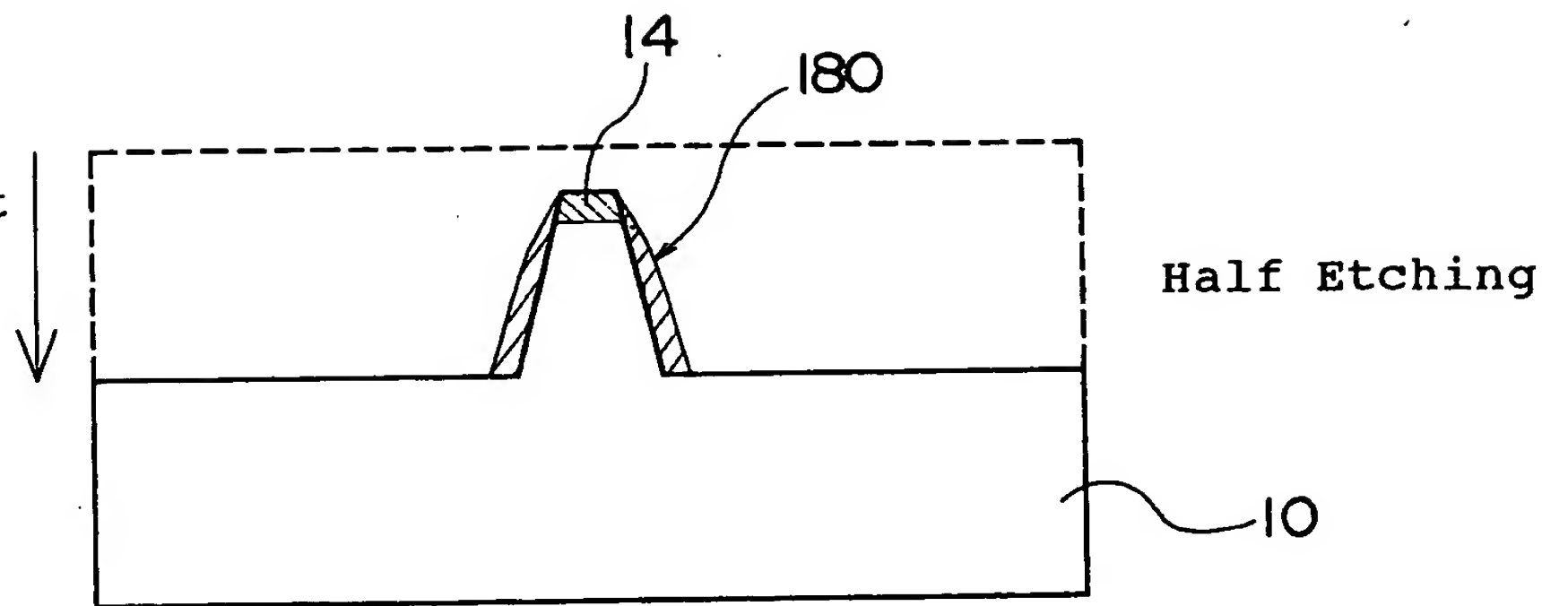
**FIG. 10B**



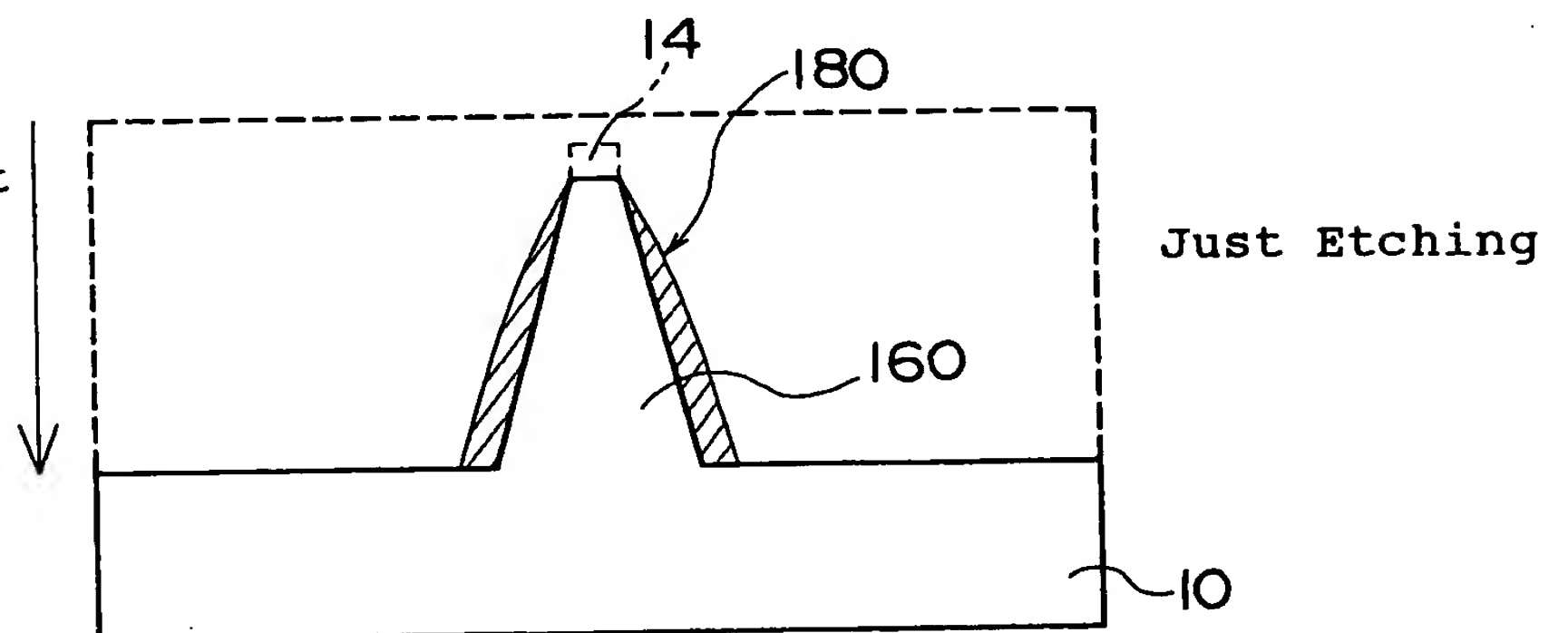
**FIG. 10C**



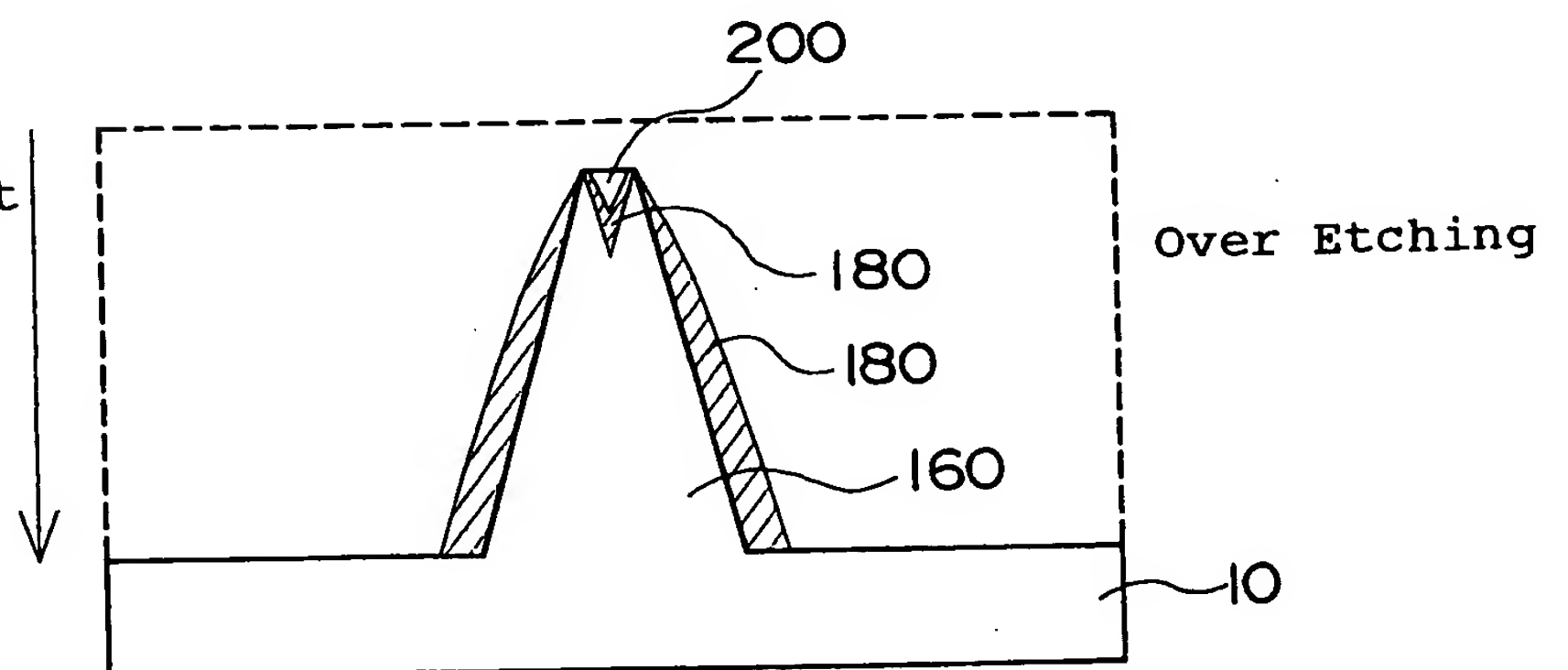
Etched Amount  
**FIG. 10D**

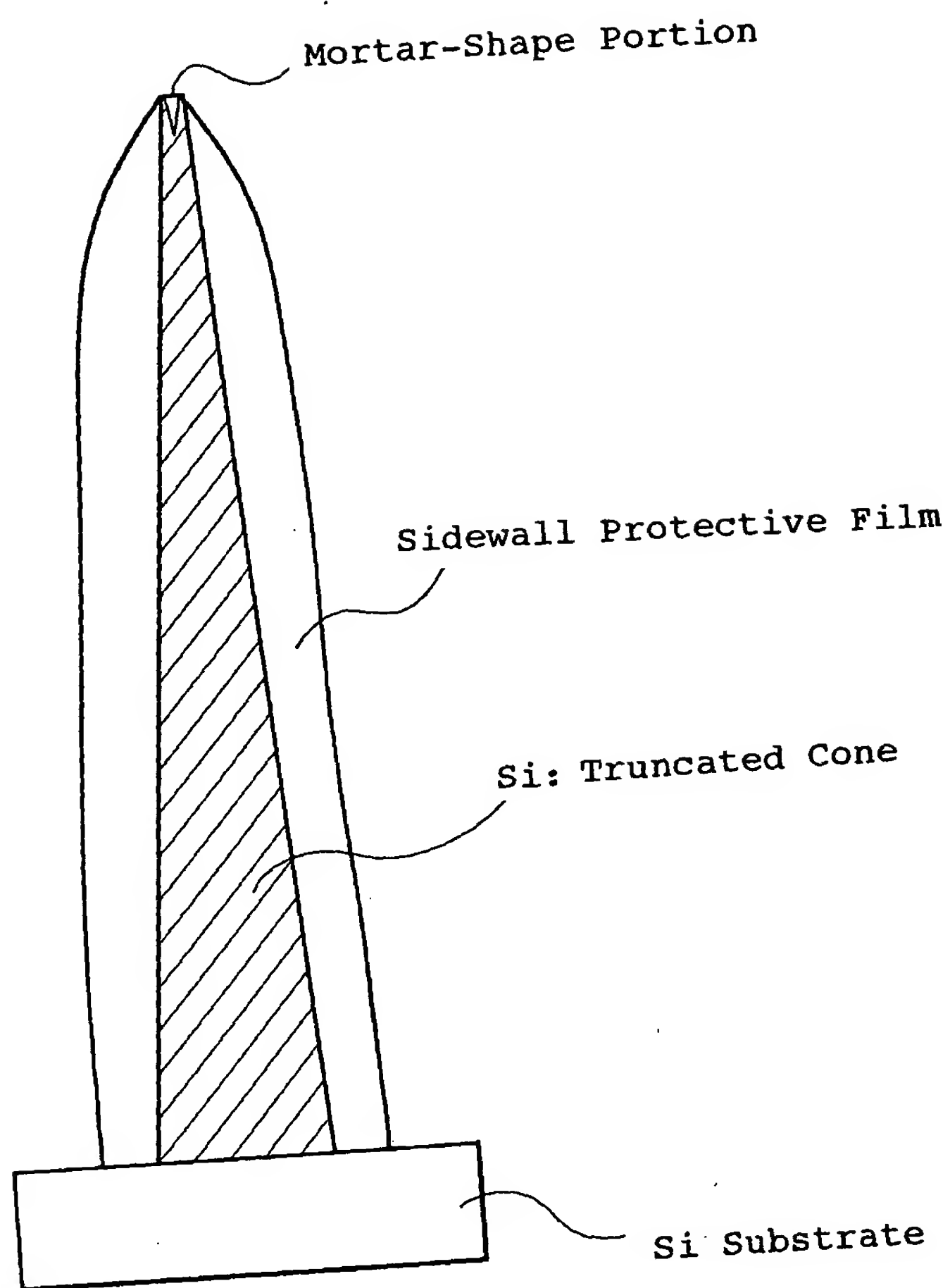


Etched Amount  
**FIG. 10E**



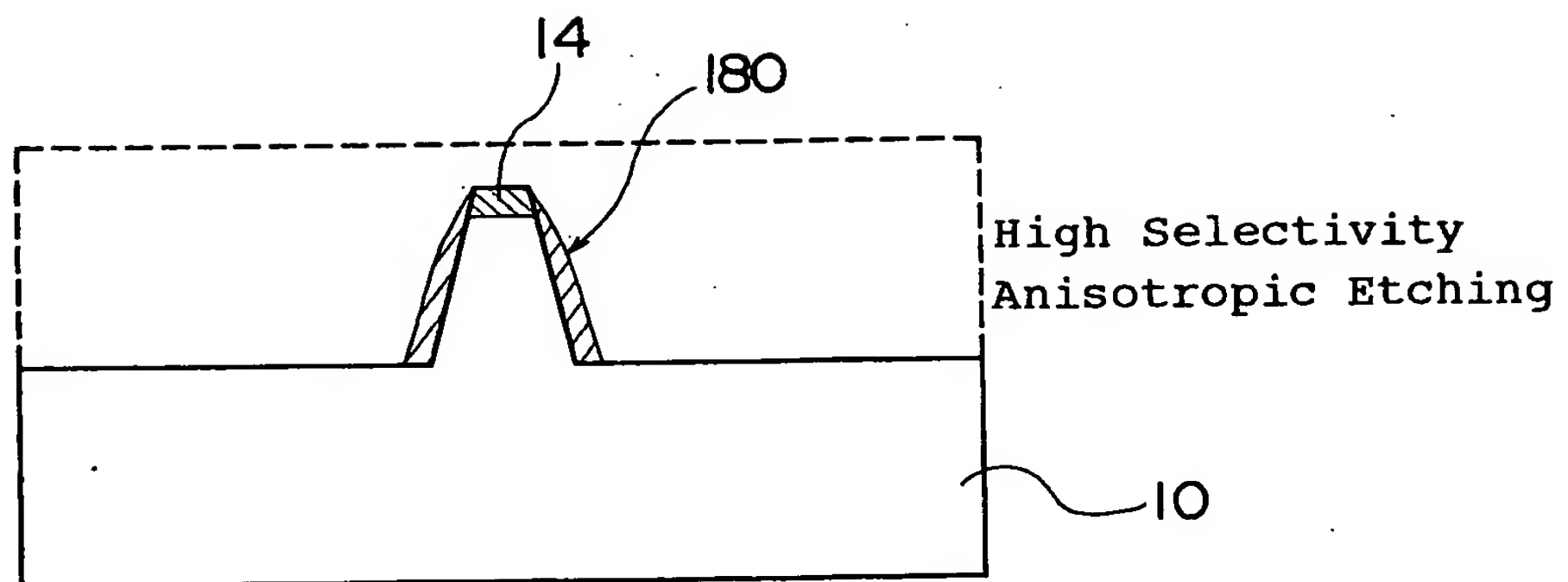
Etched Amount  
**FIG. 10F**



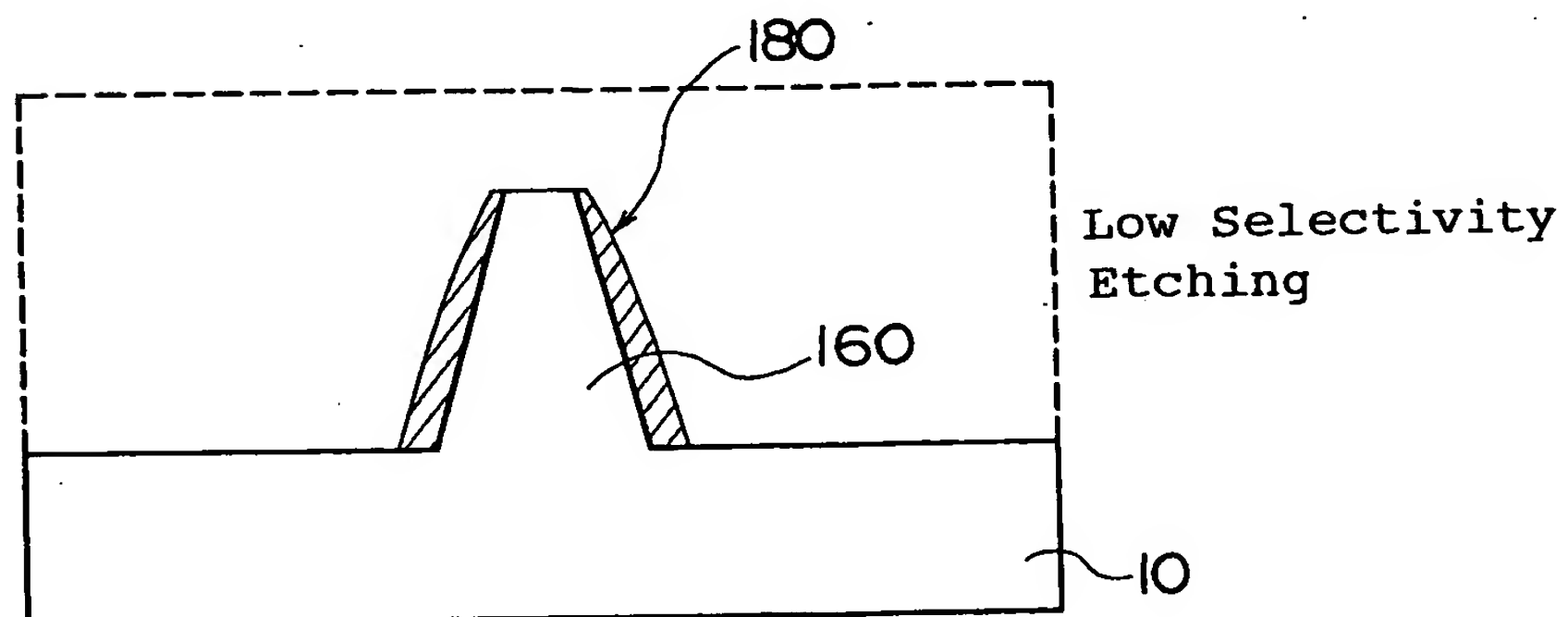


**FIG. 11**

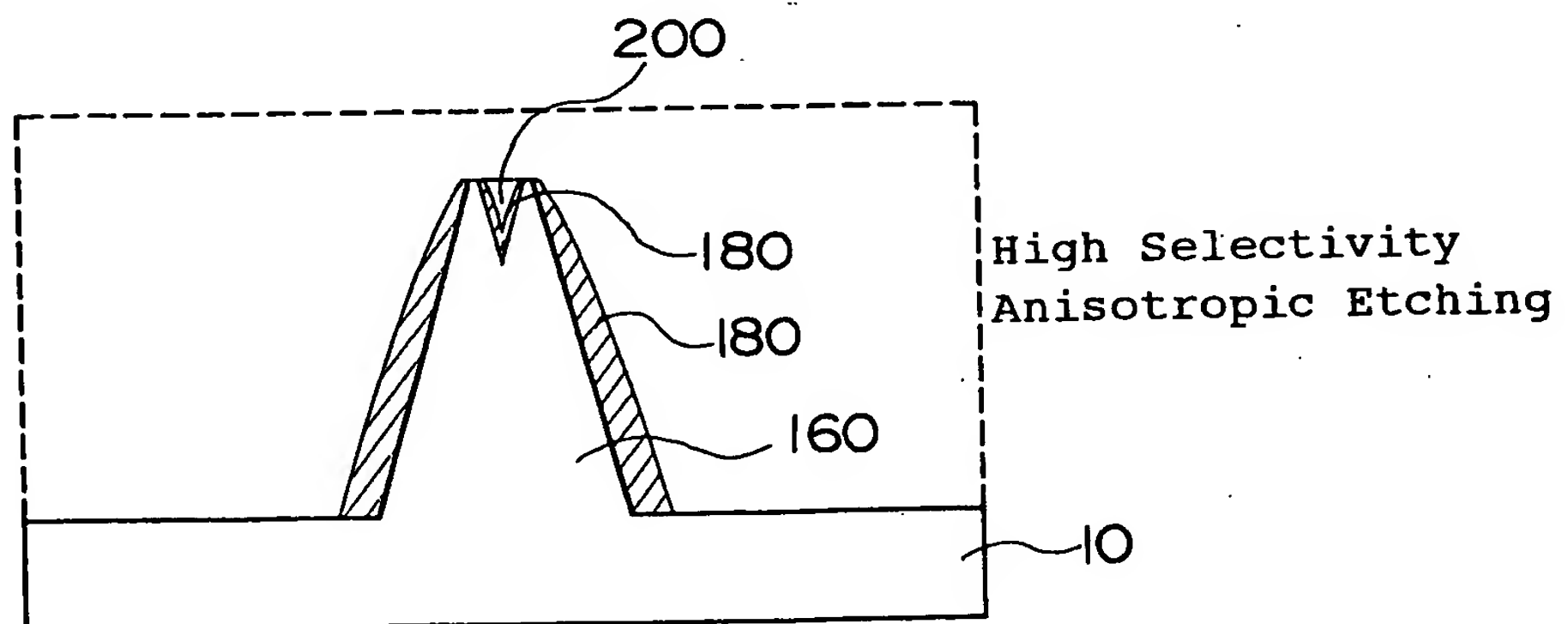
**FIG. 12A**



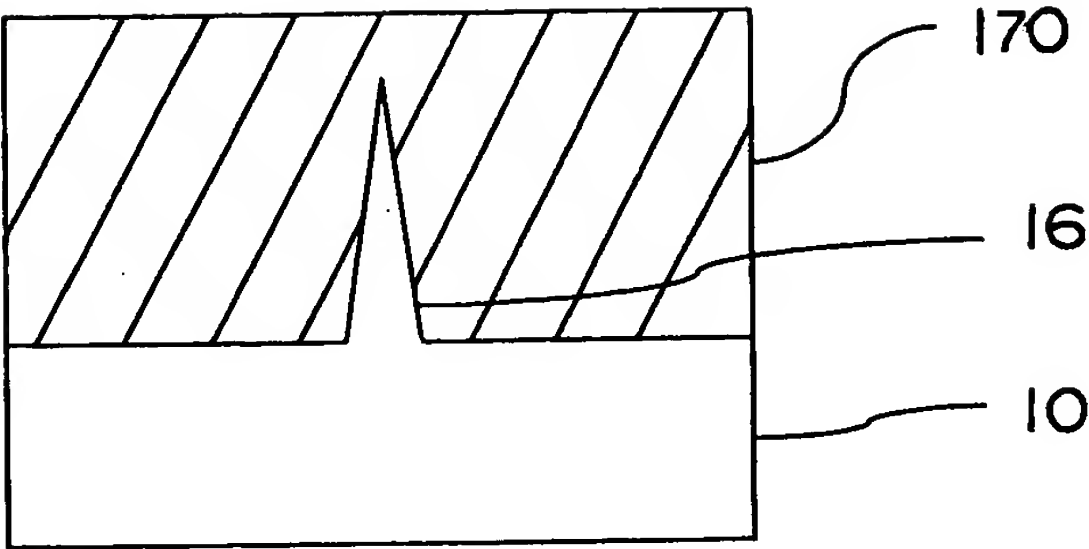
**FIG. 12B**



**FIG. 12C**

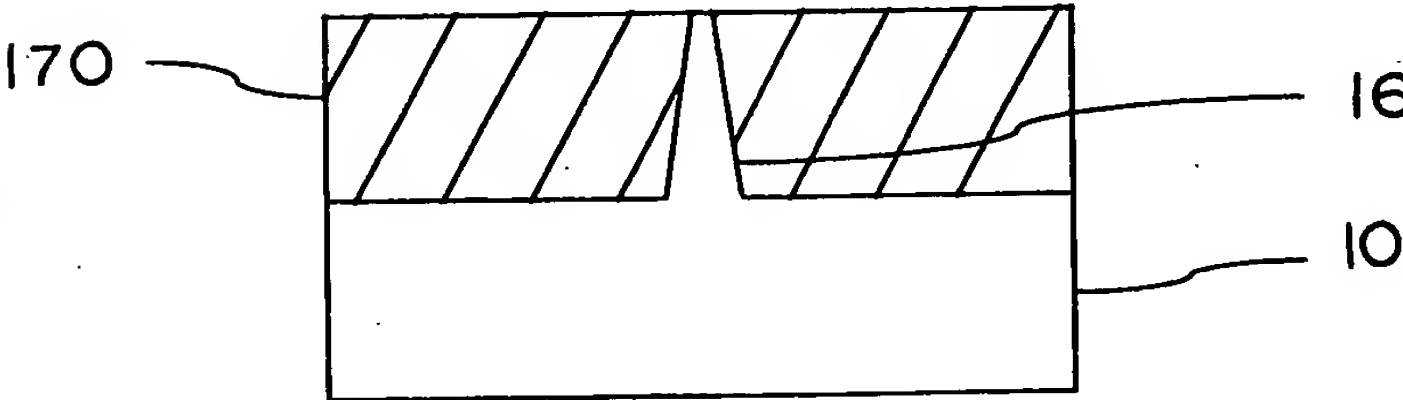


**FIG. 13A**

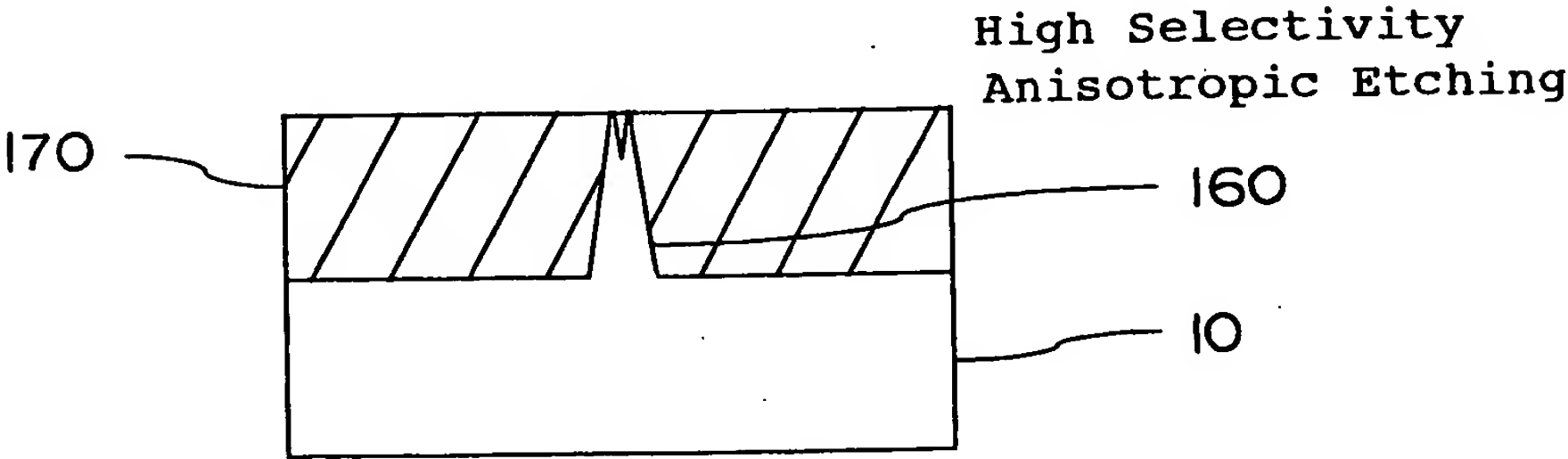


CMP or Etch Back

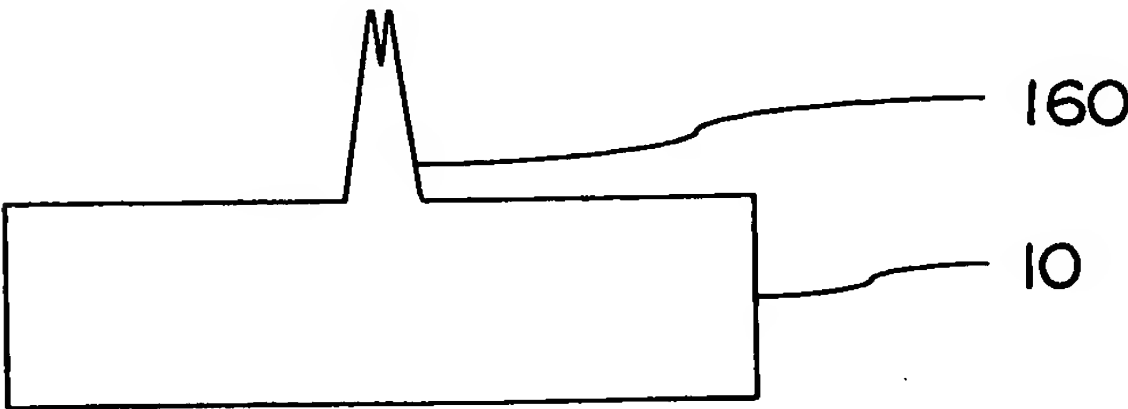
**FIG. 13B**

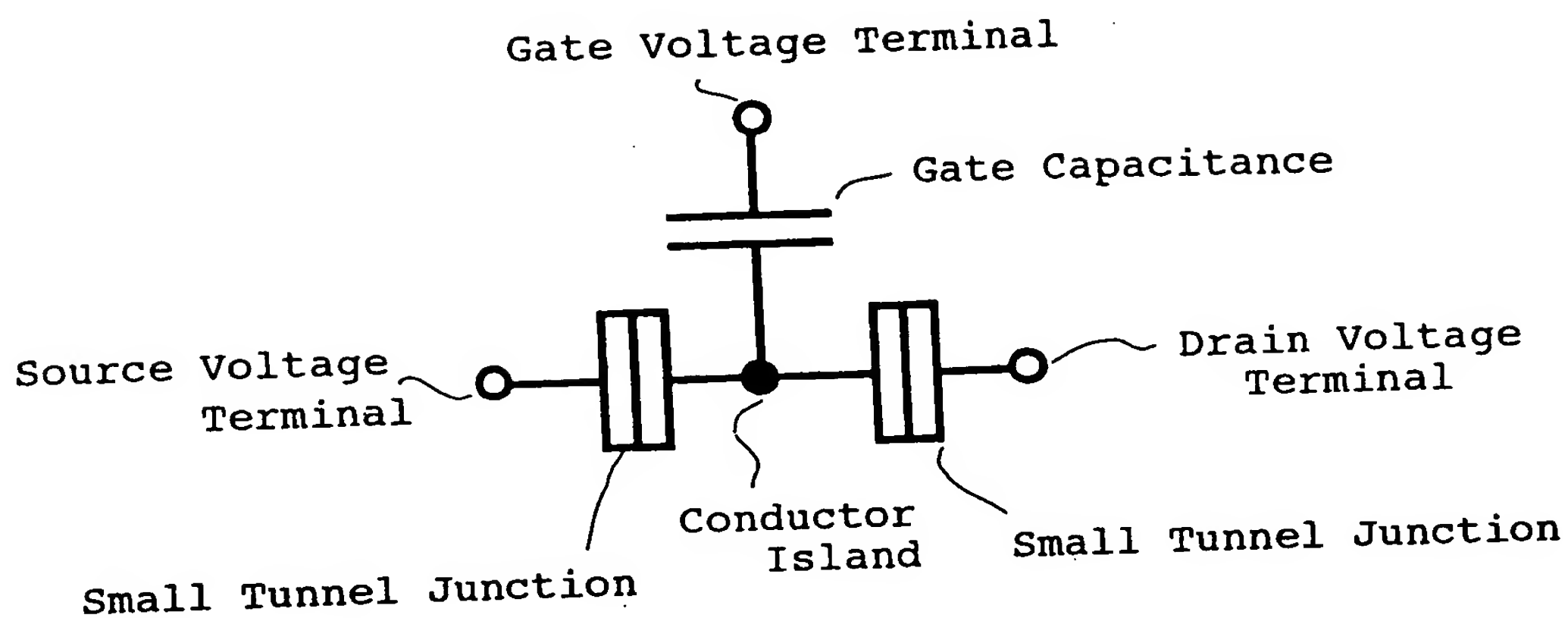


**FIG. 13C**

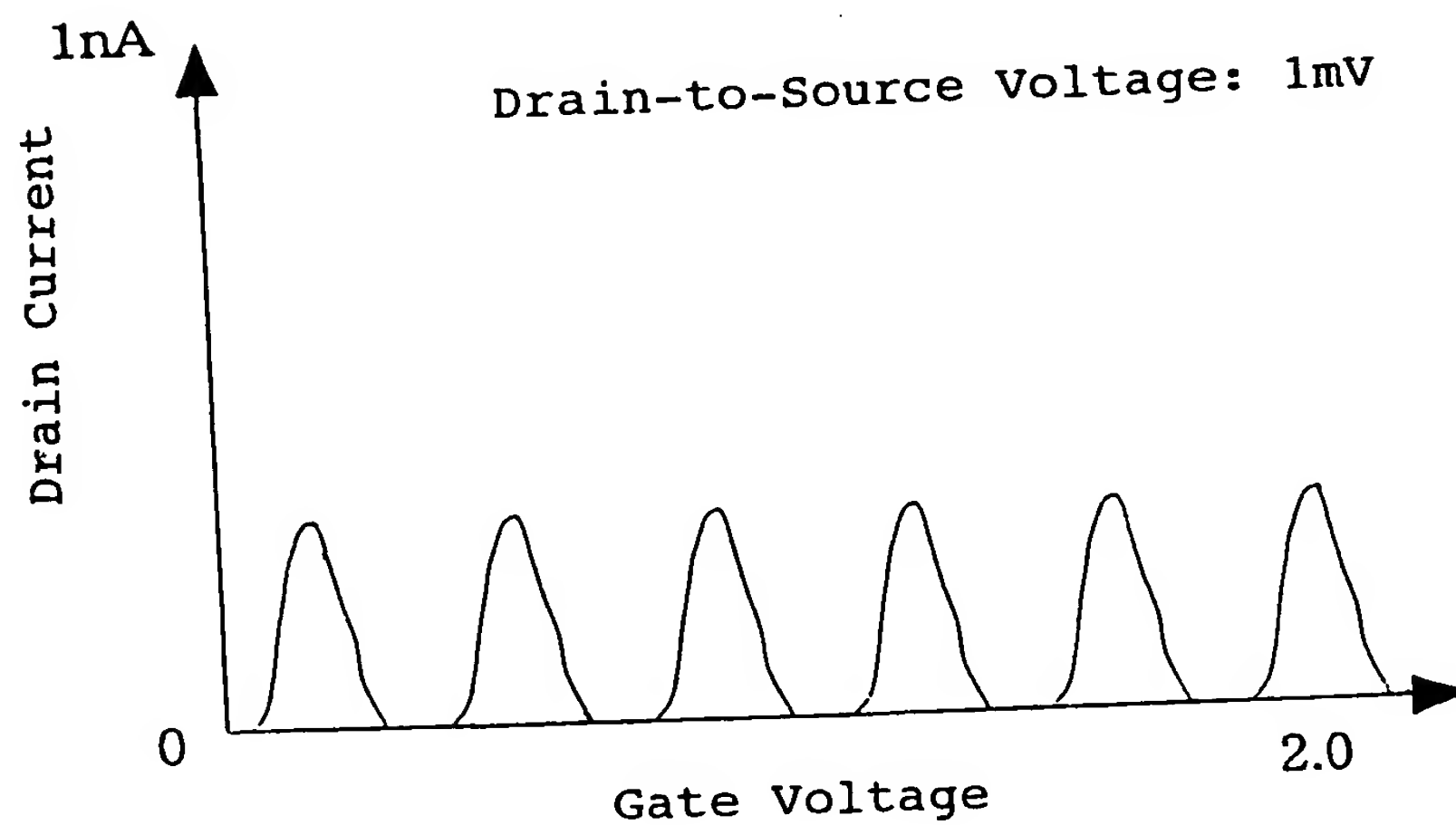


**FIG. 13D**



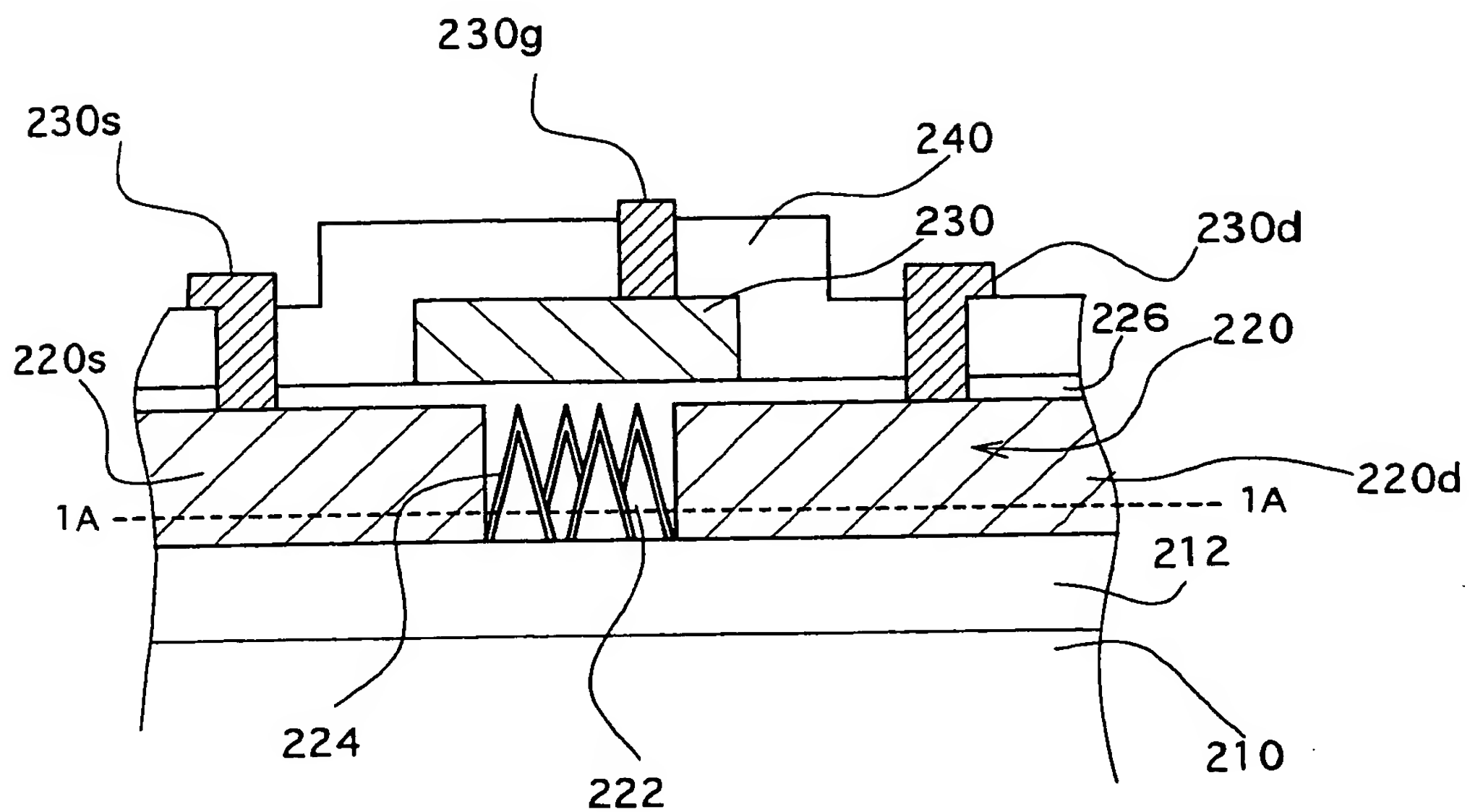


**FIG. 14A PRIOR ART**

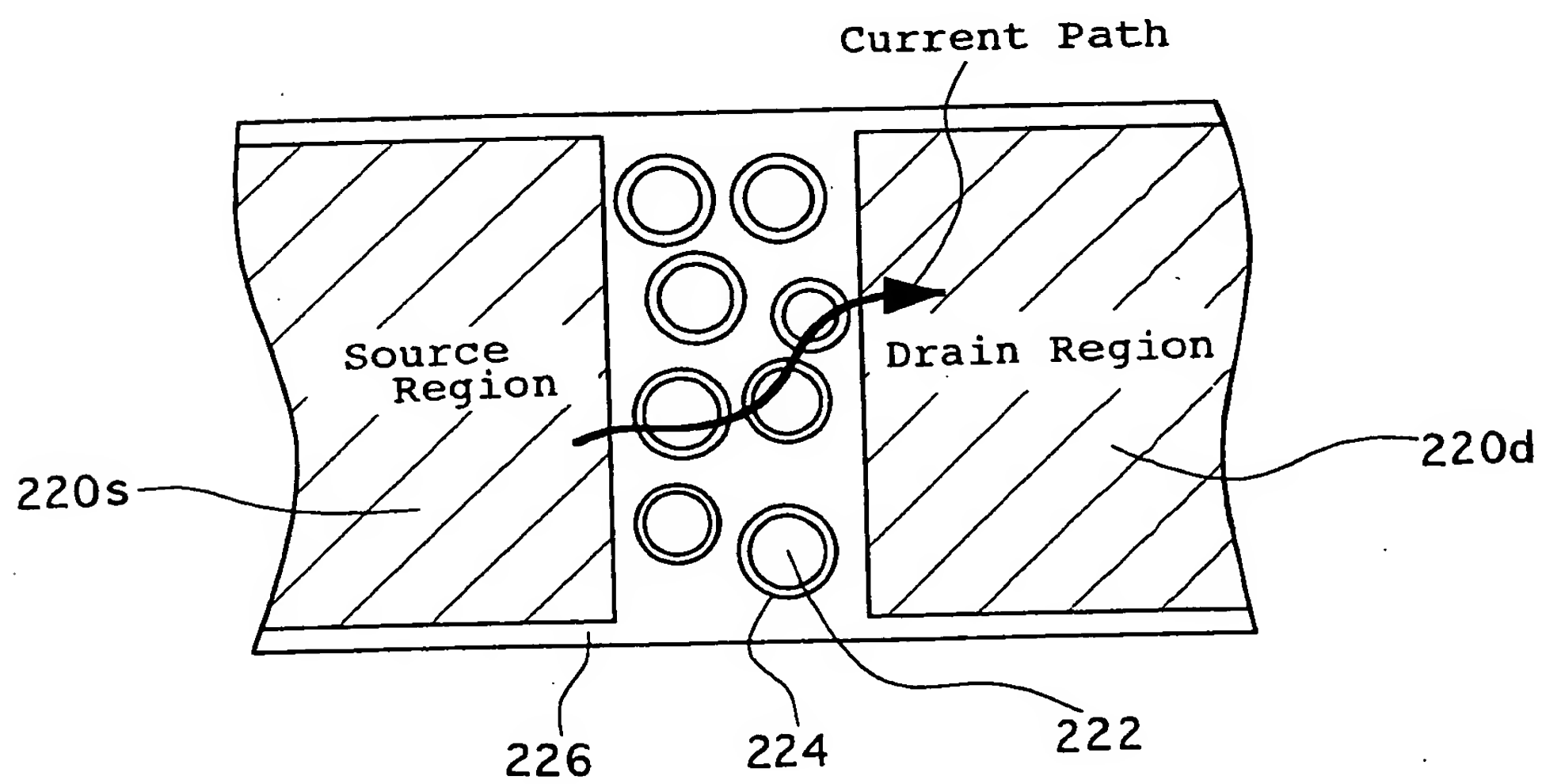


**FIG. 14B PRIOR ART**

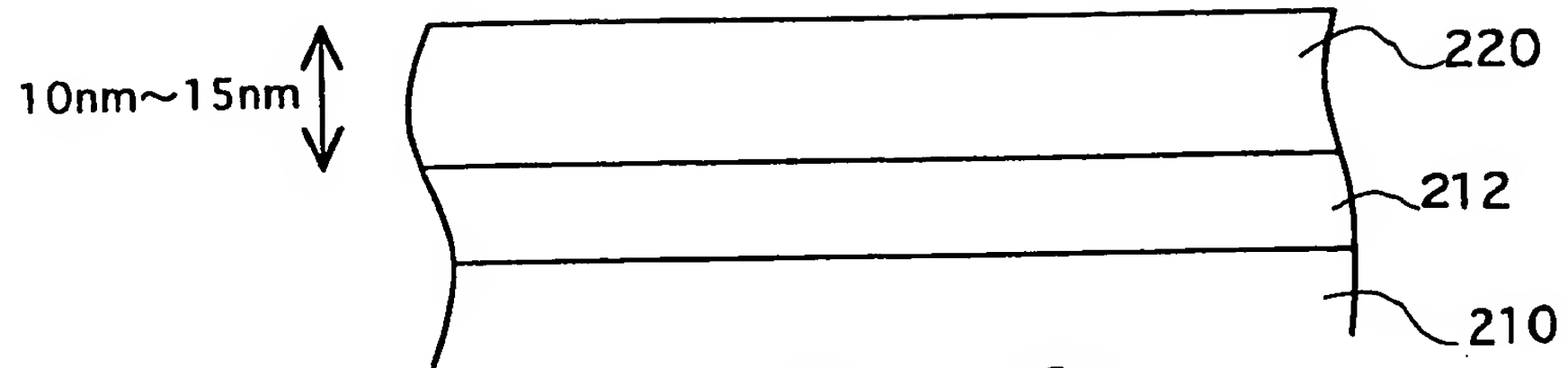




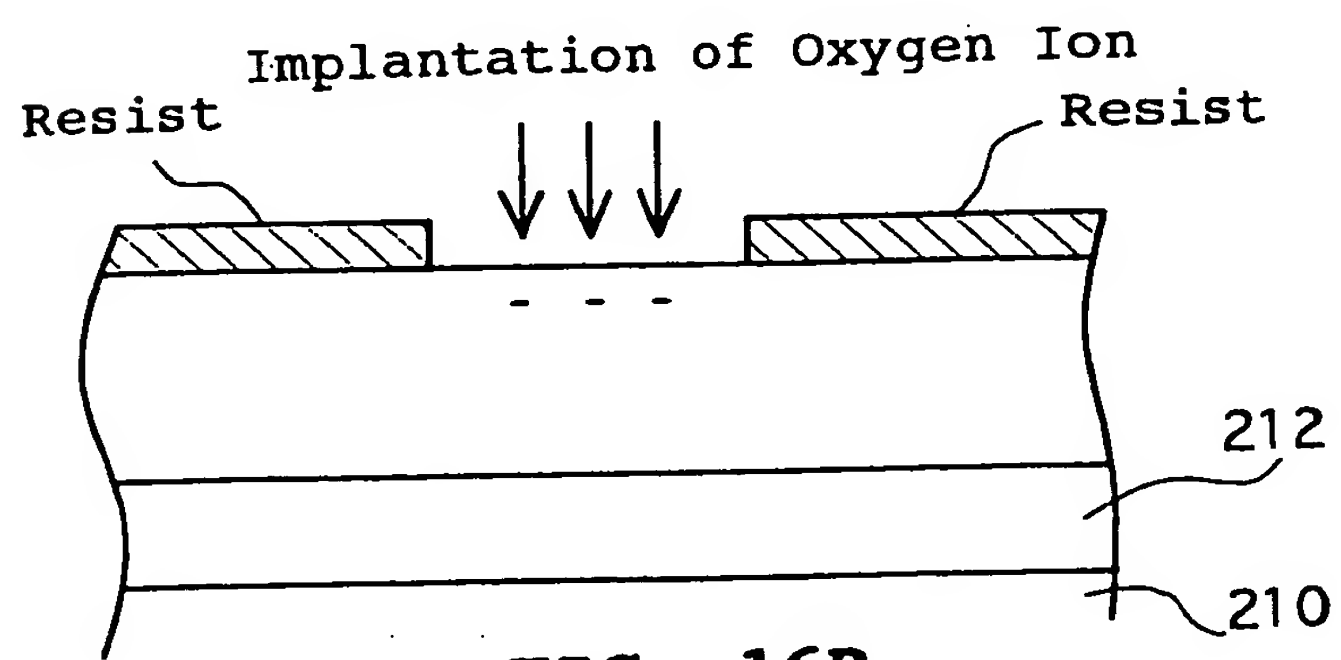
**FIG. 15A**



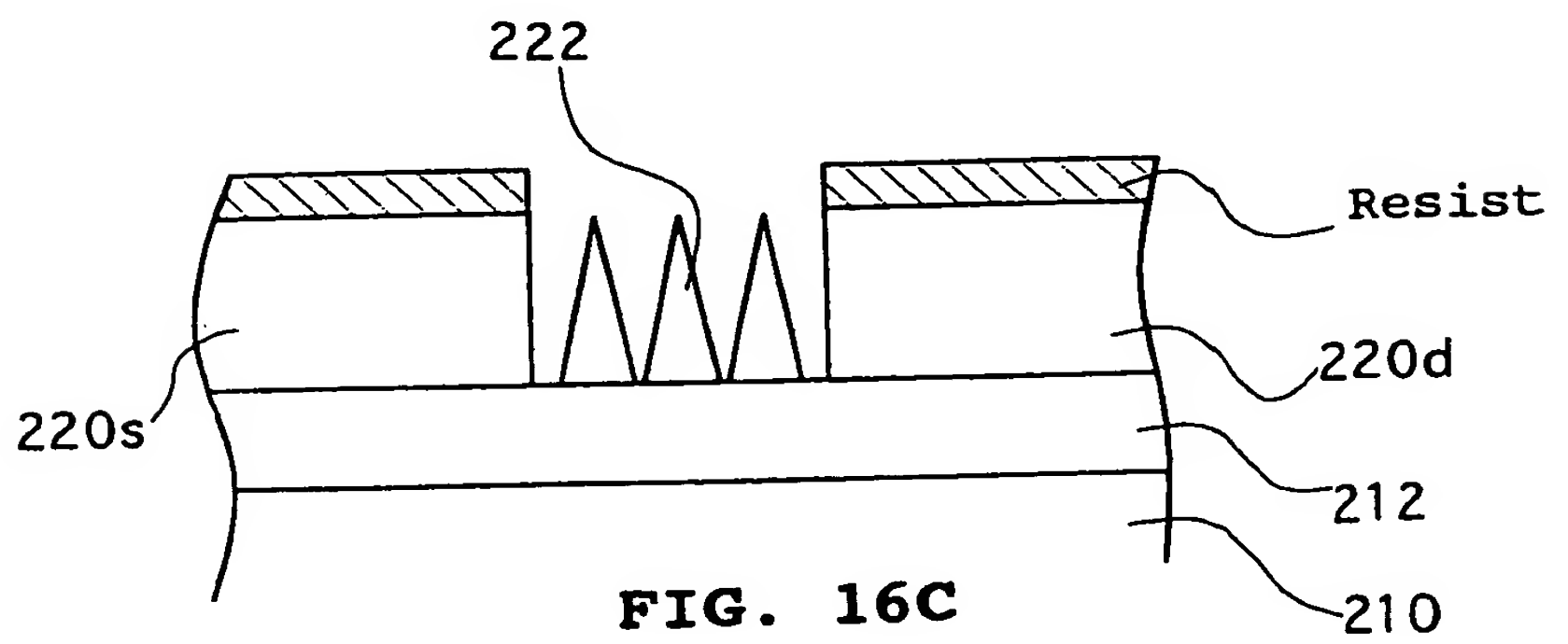
**FIG. 15B**



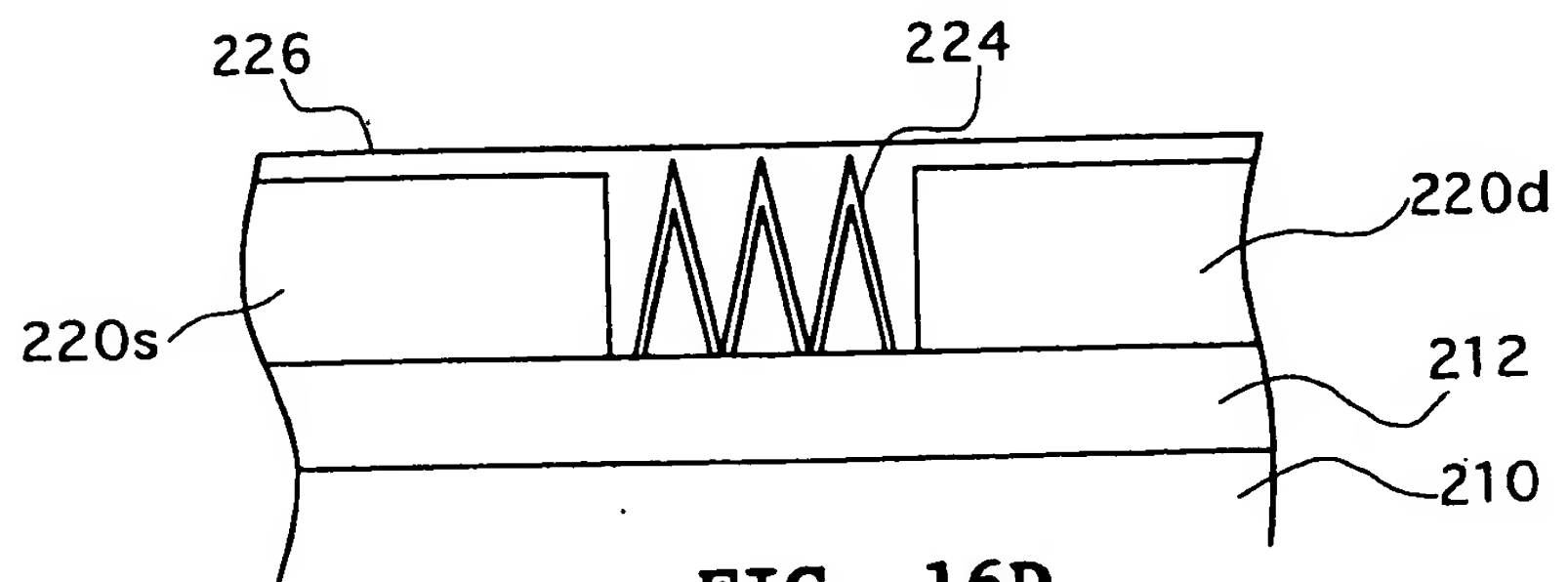
**FIG. 16A**



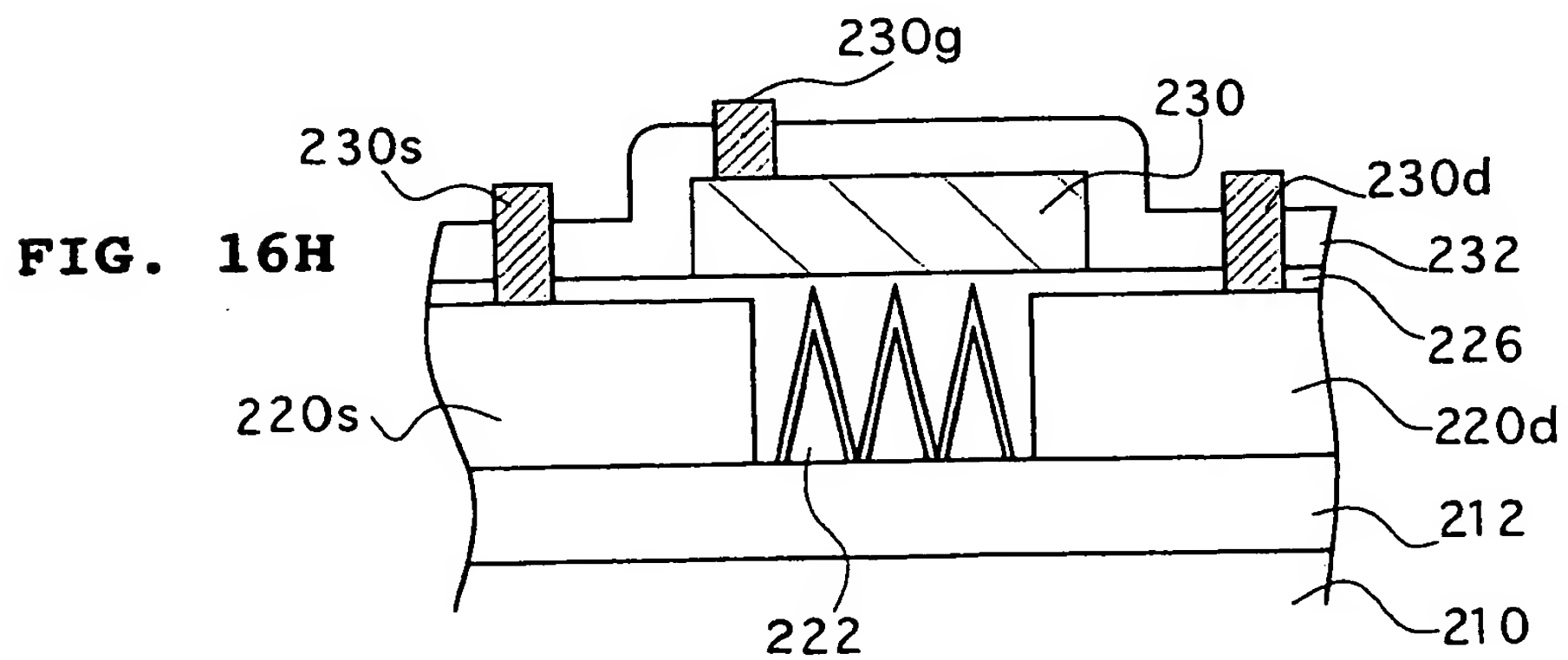
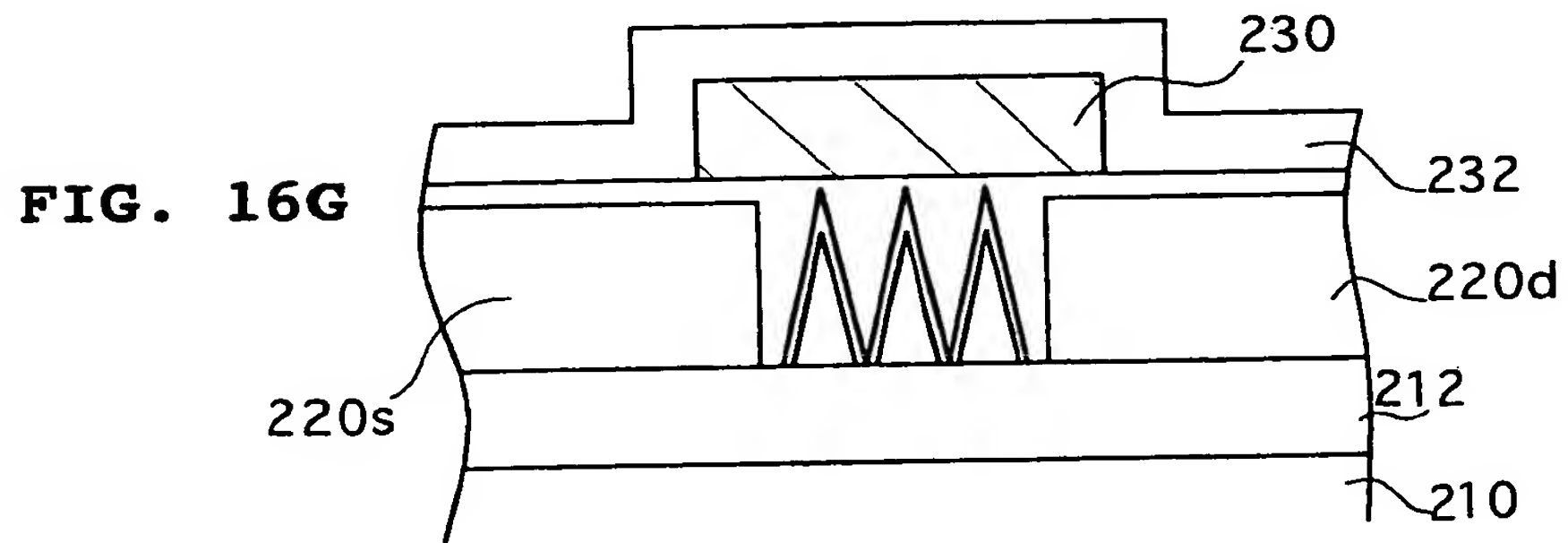
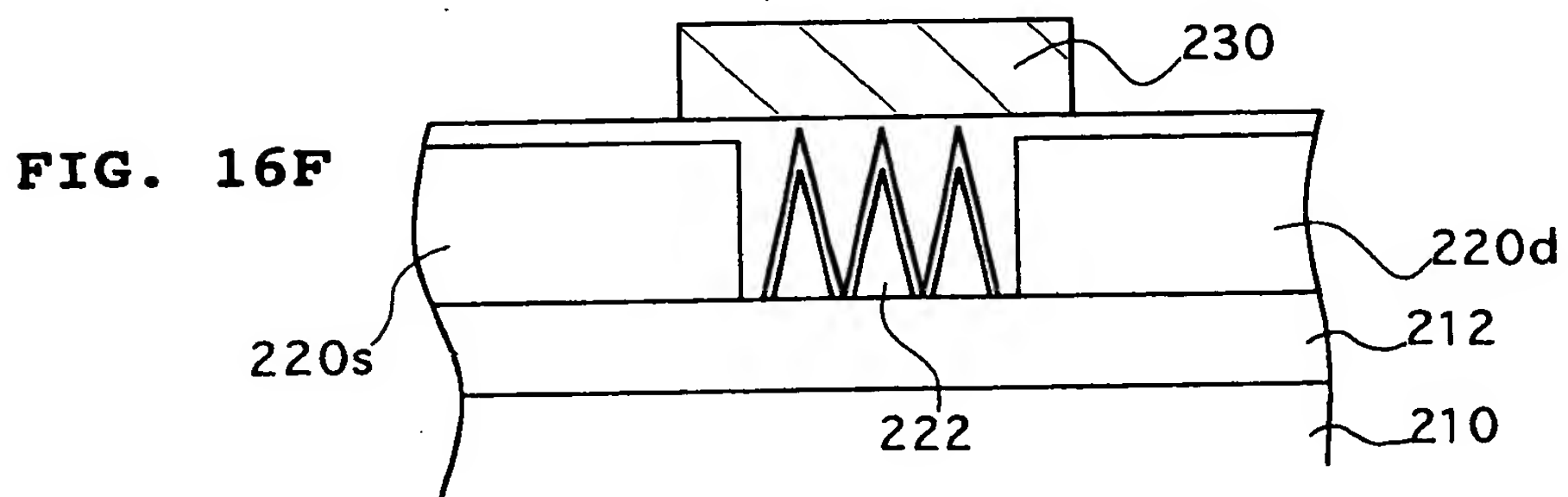
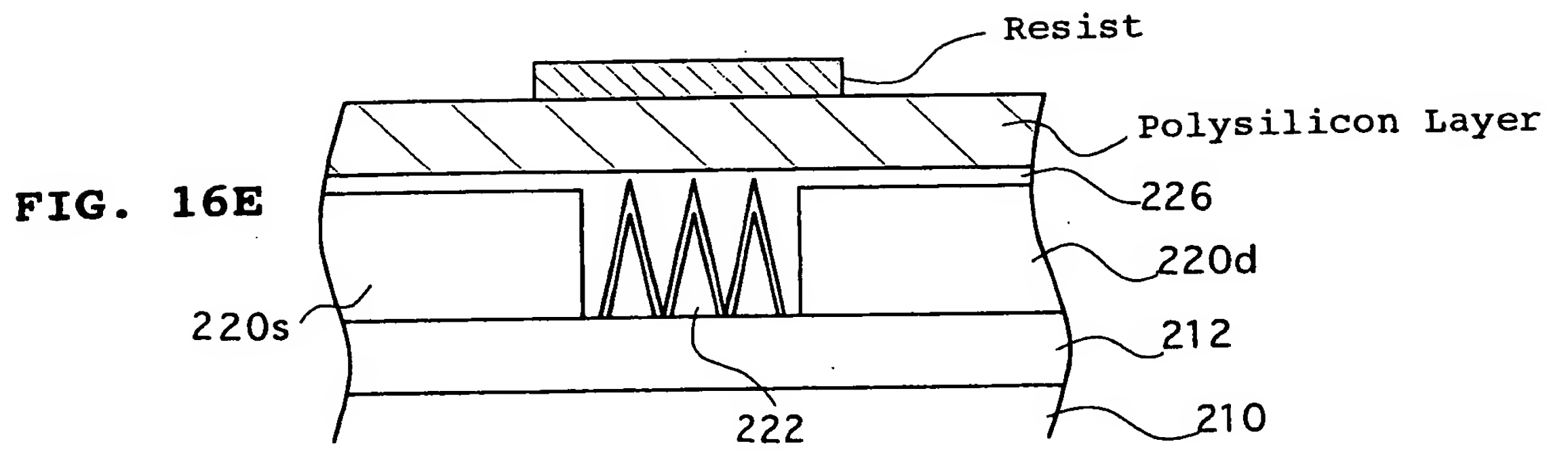
**FIG. 16B**



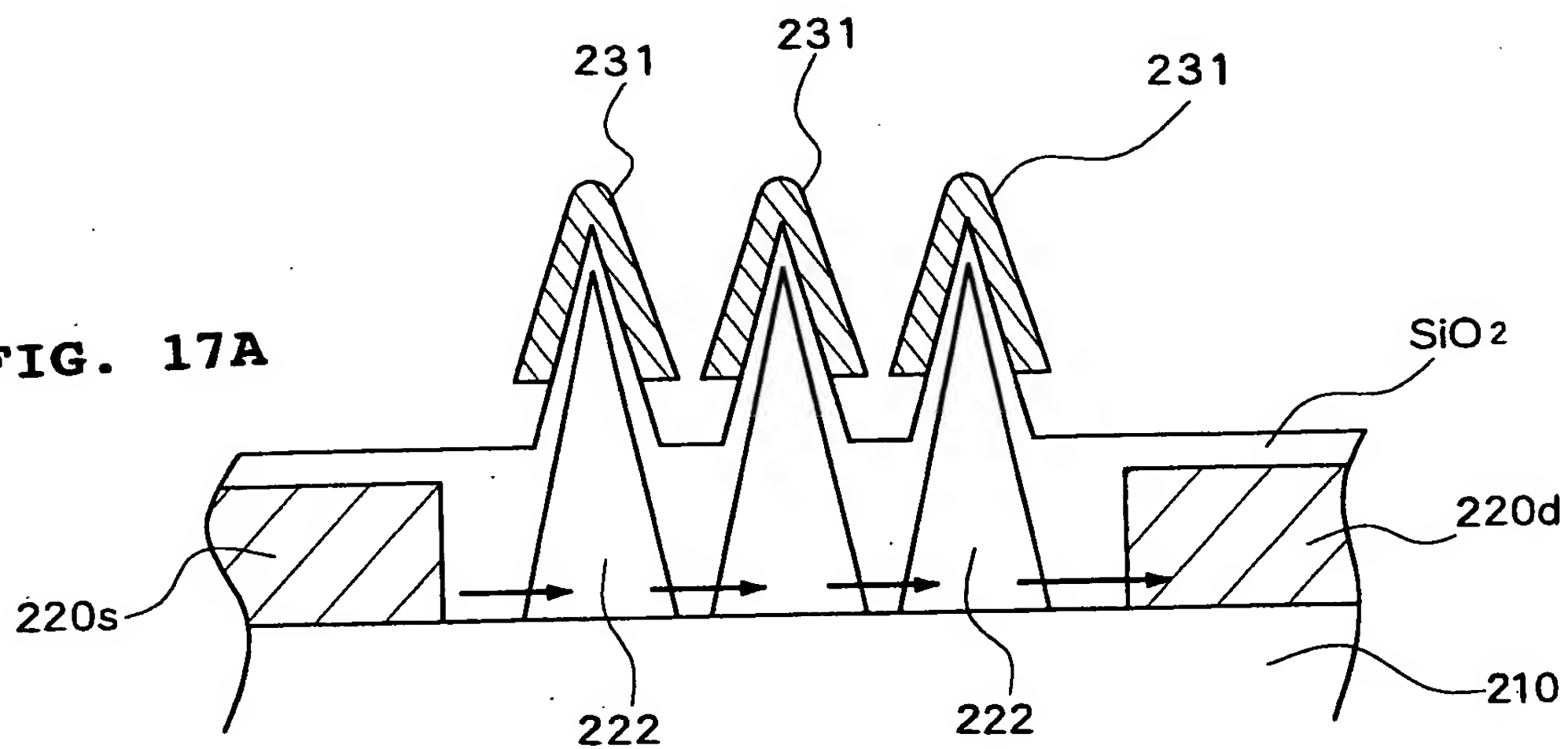
**FIG. 16C**



**FIG. 16D**

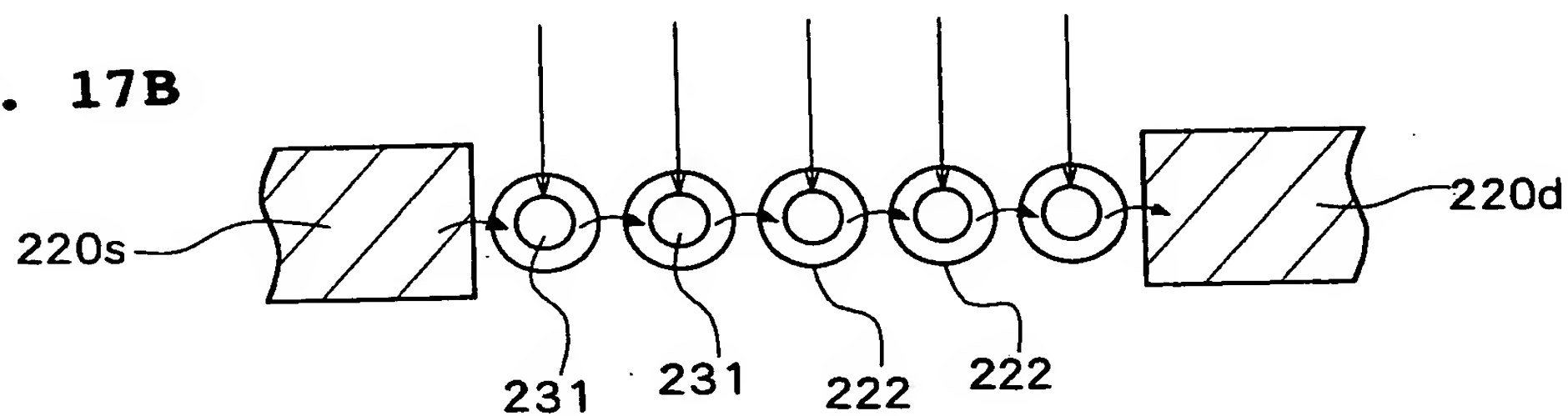


**FIG. 17A**

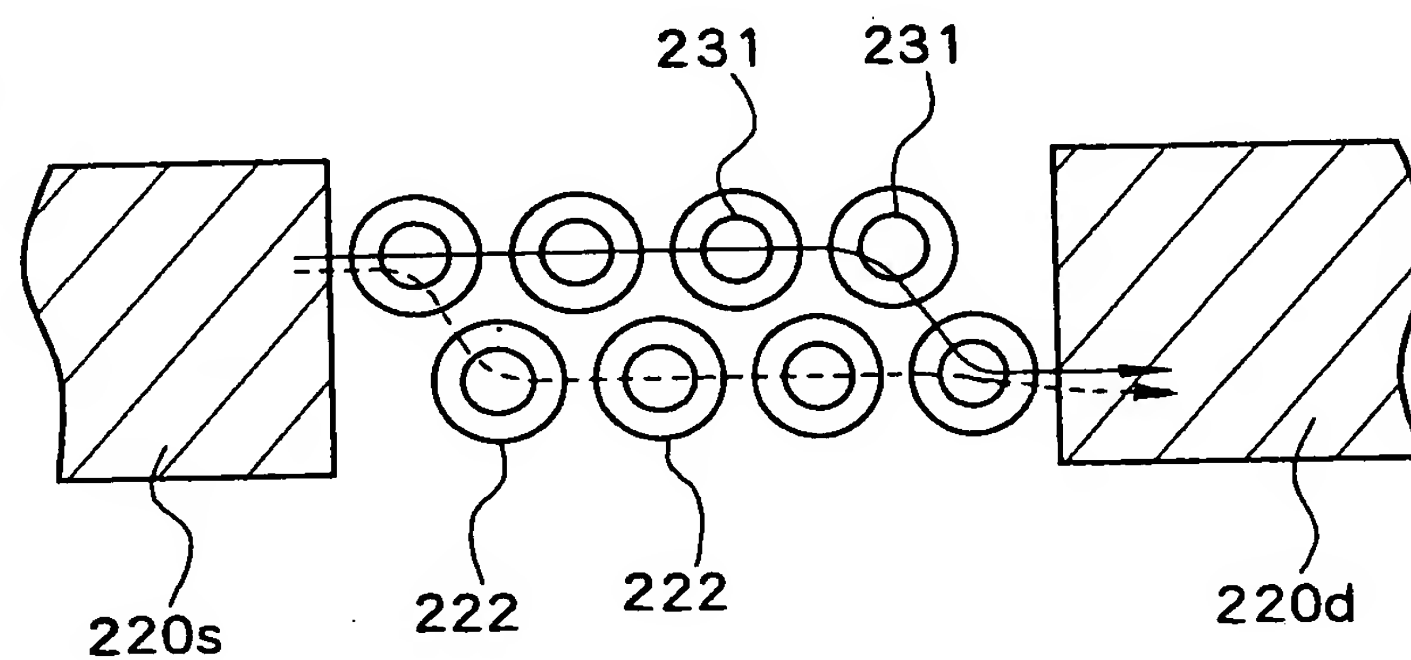


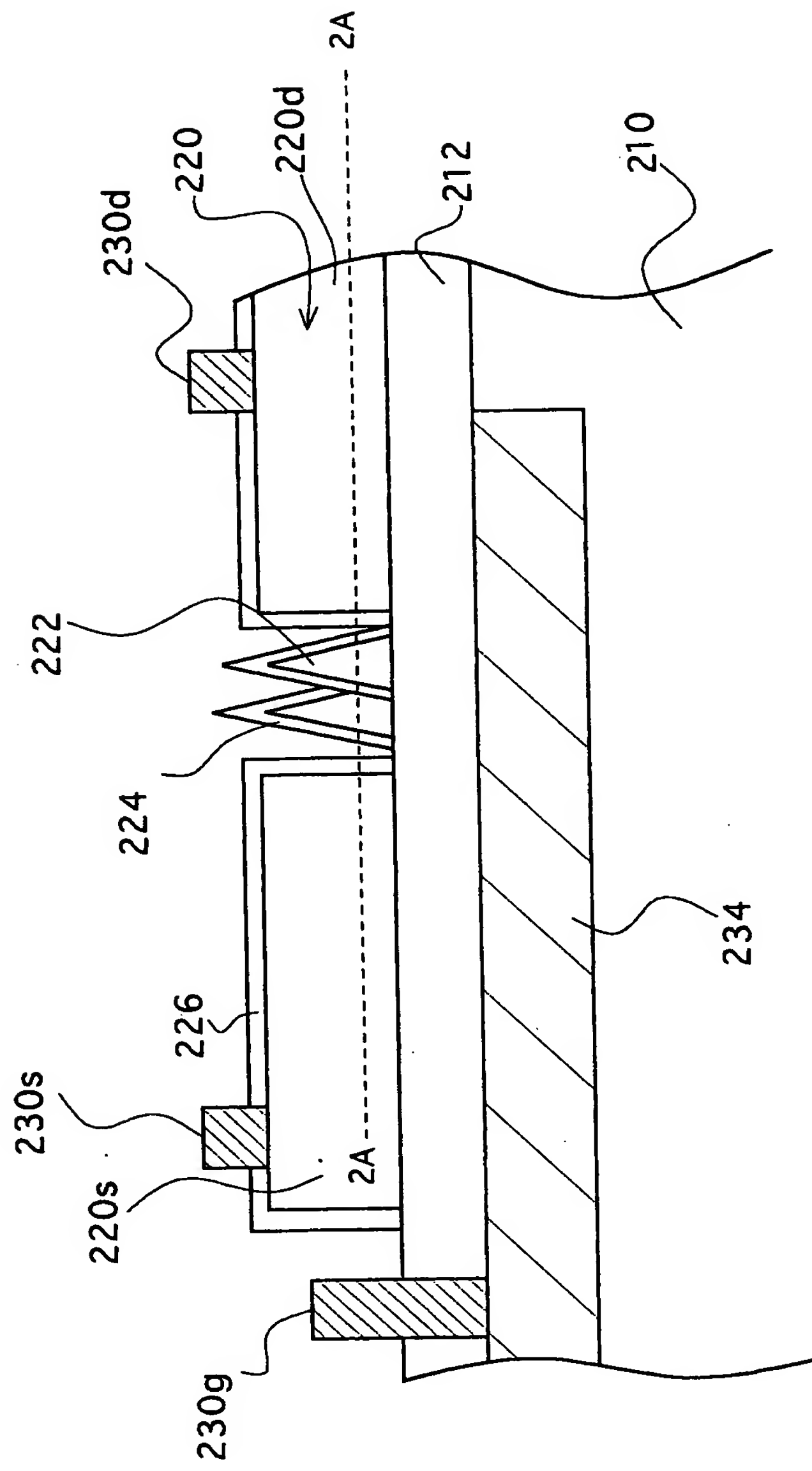
Selective Gate Control

**FIG. 17B**

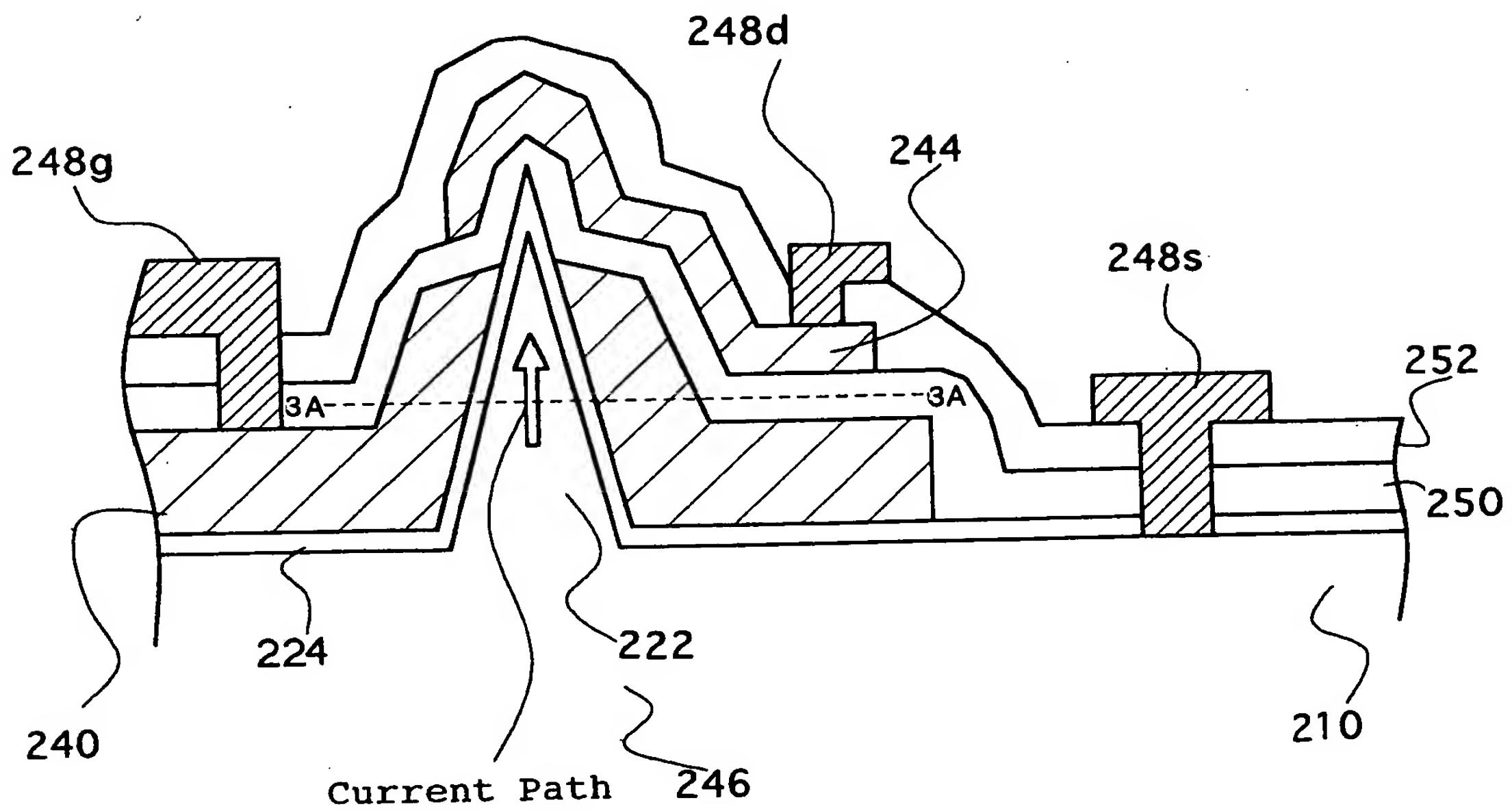


**FIG. 17C**

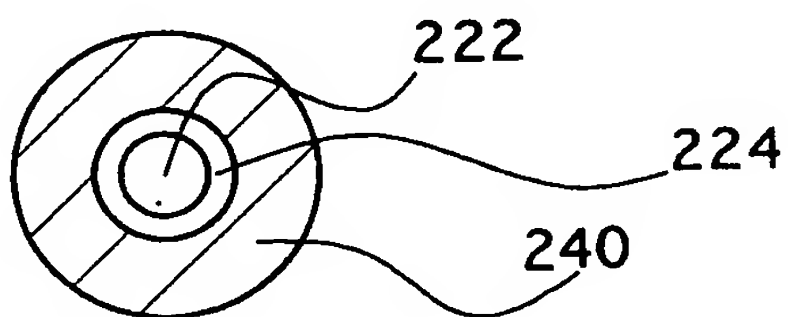




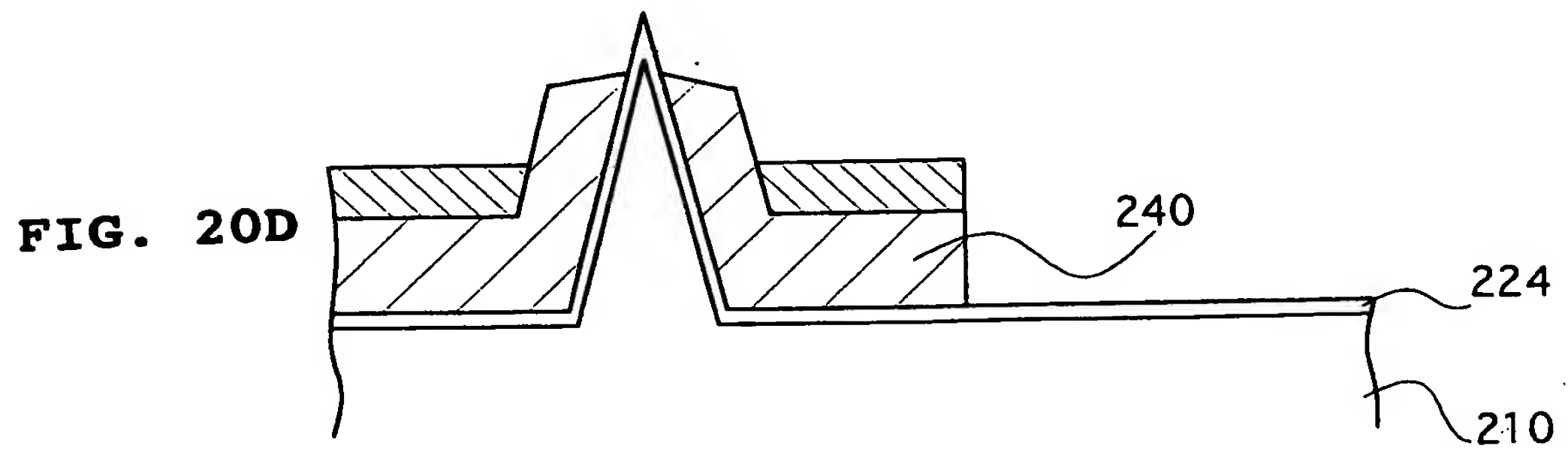
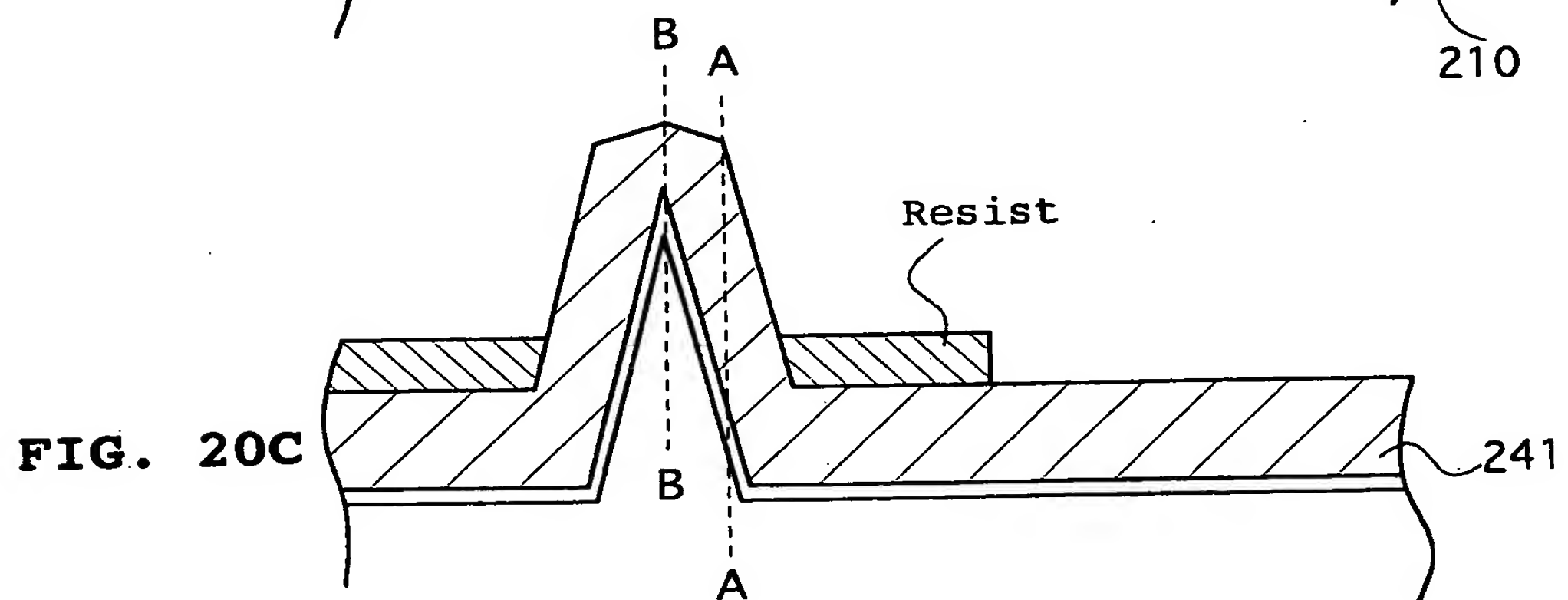
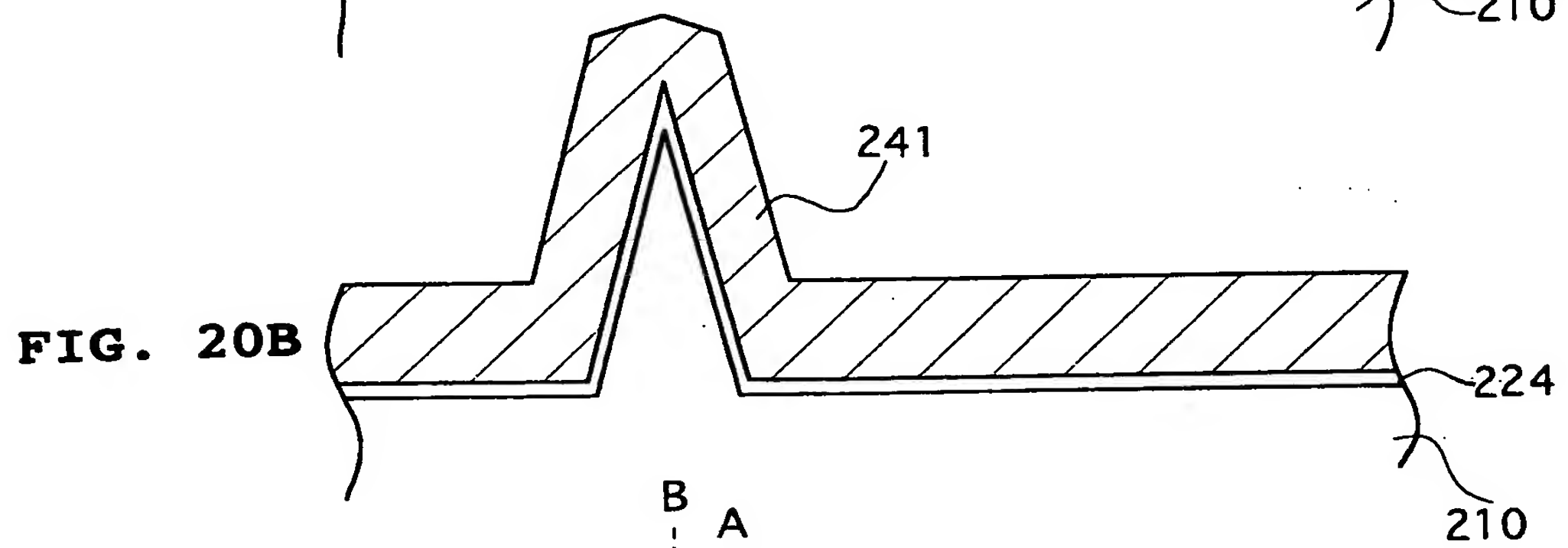
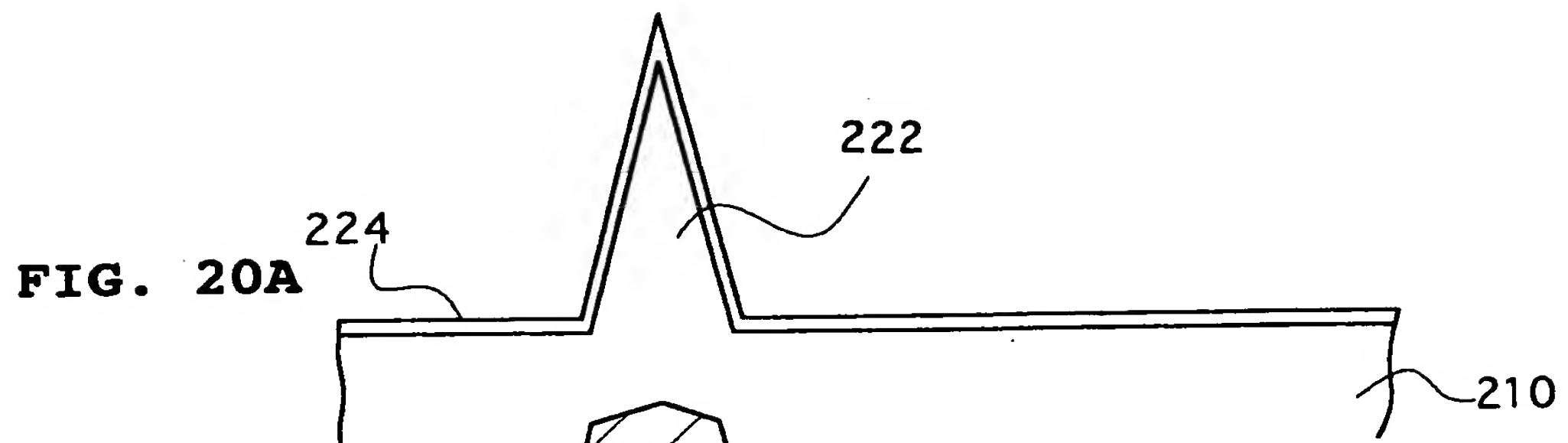
**FIG. 18**



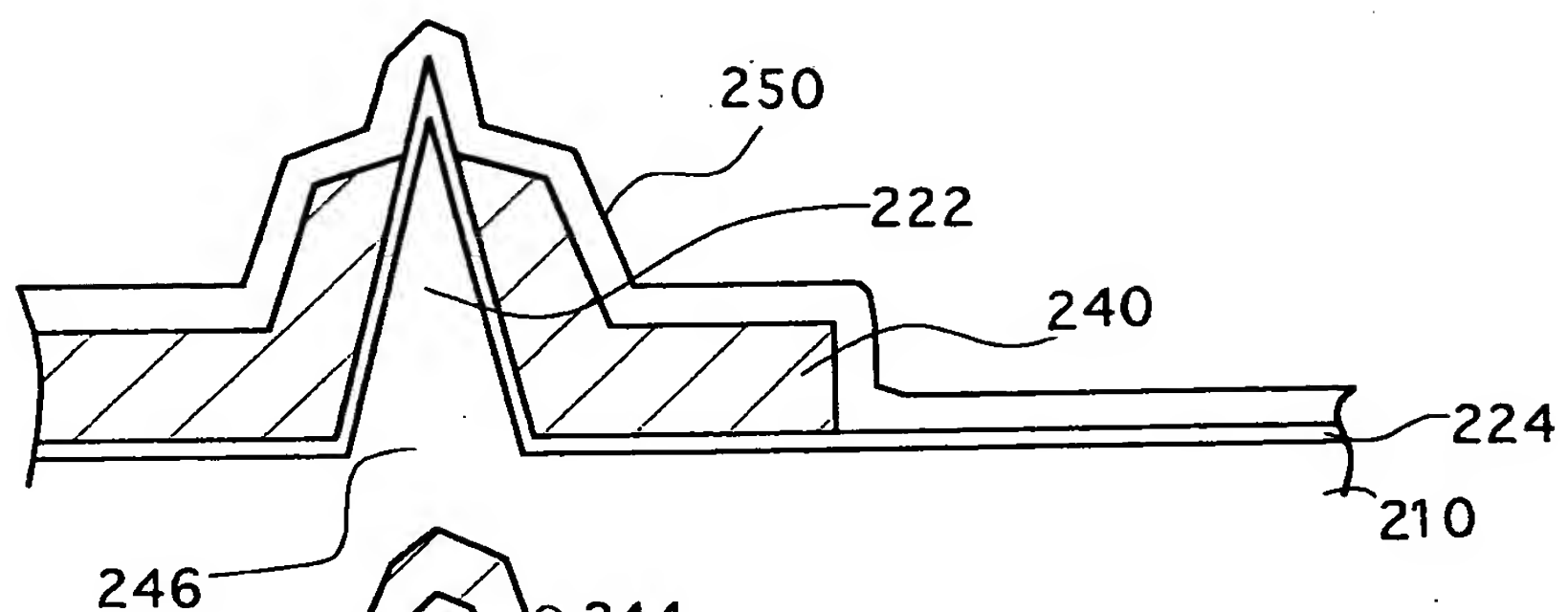
**FIG. 19A**



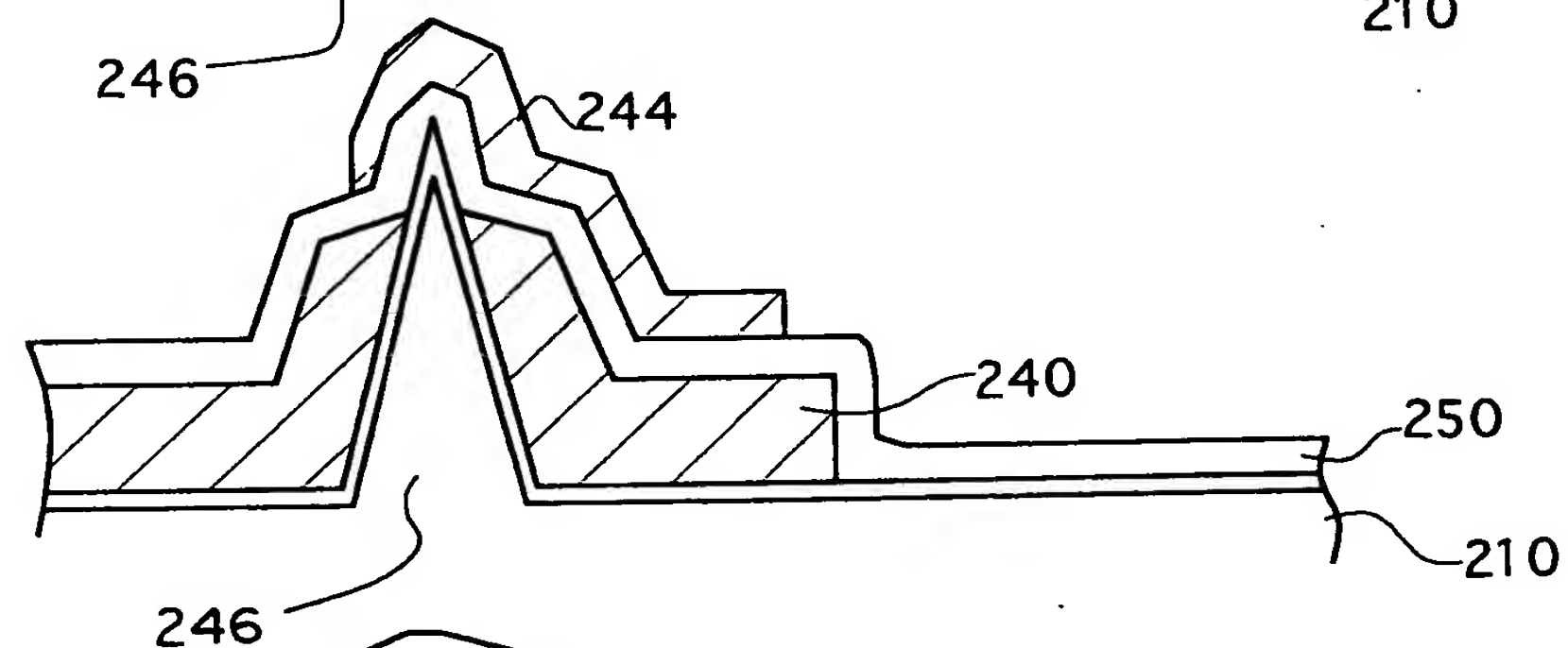
**FIG. 19B**



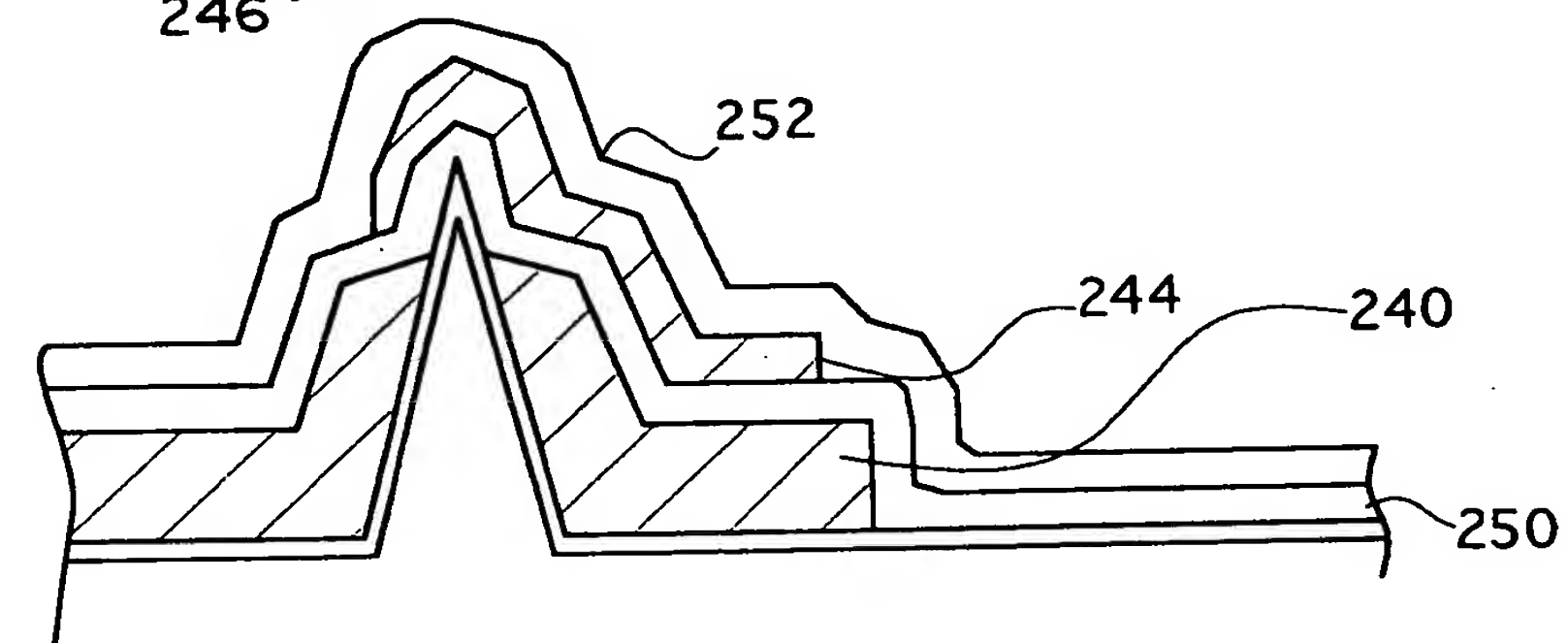
**FIG. 20E**



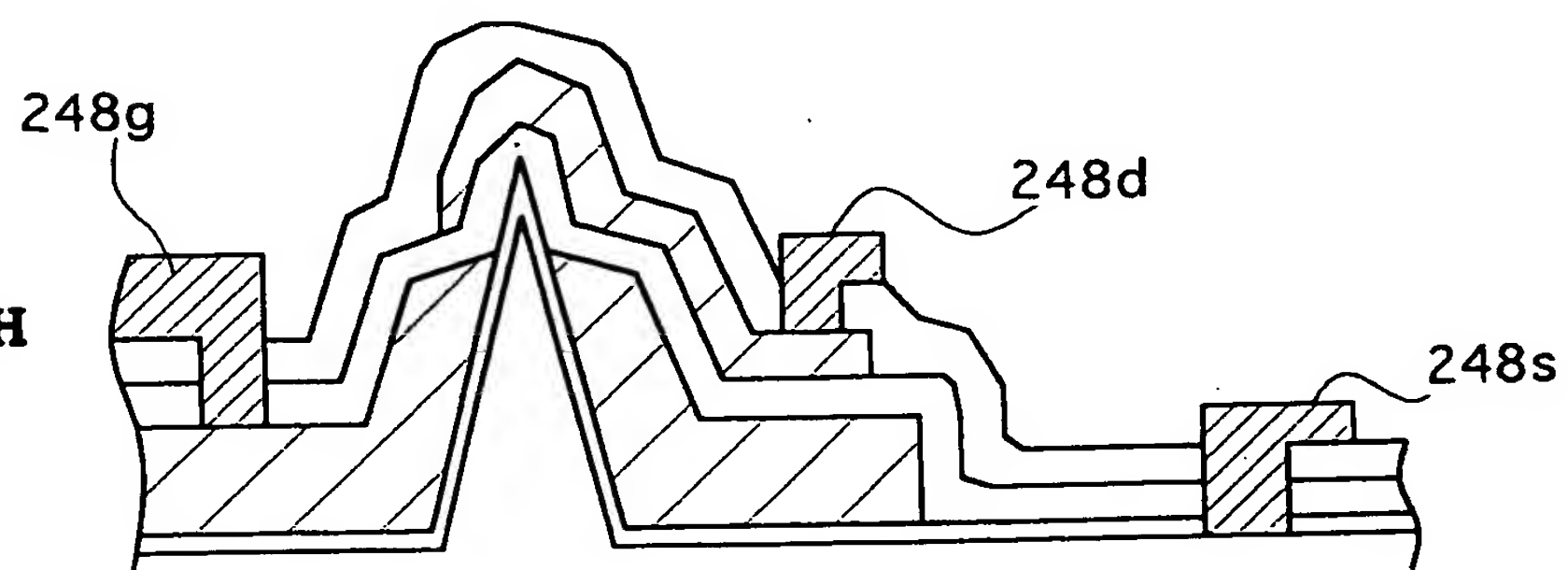
**FIG. 20F**



**FIG. 20G**



**FIG. 20H**





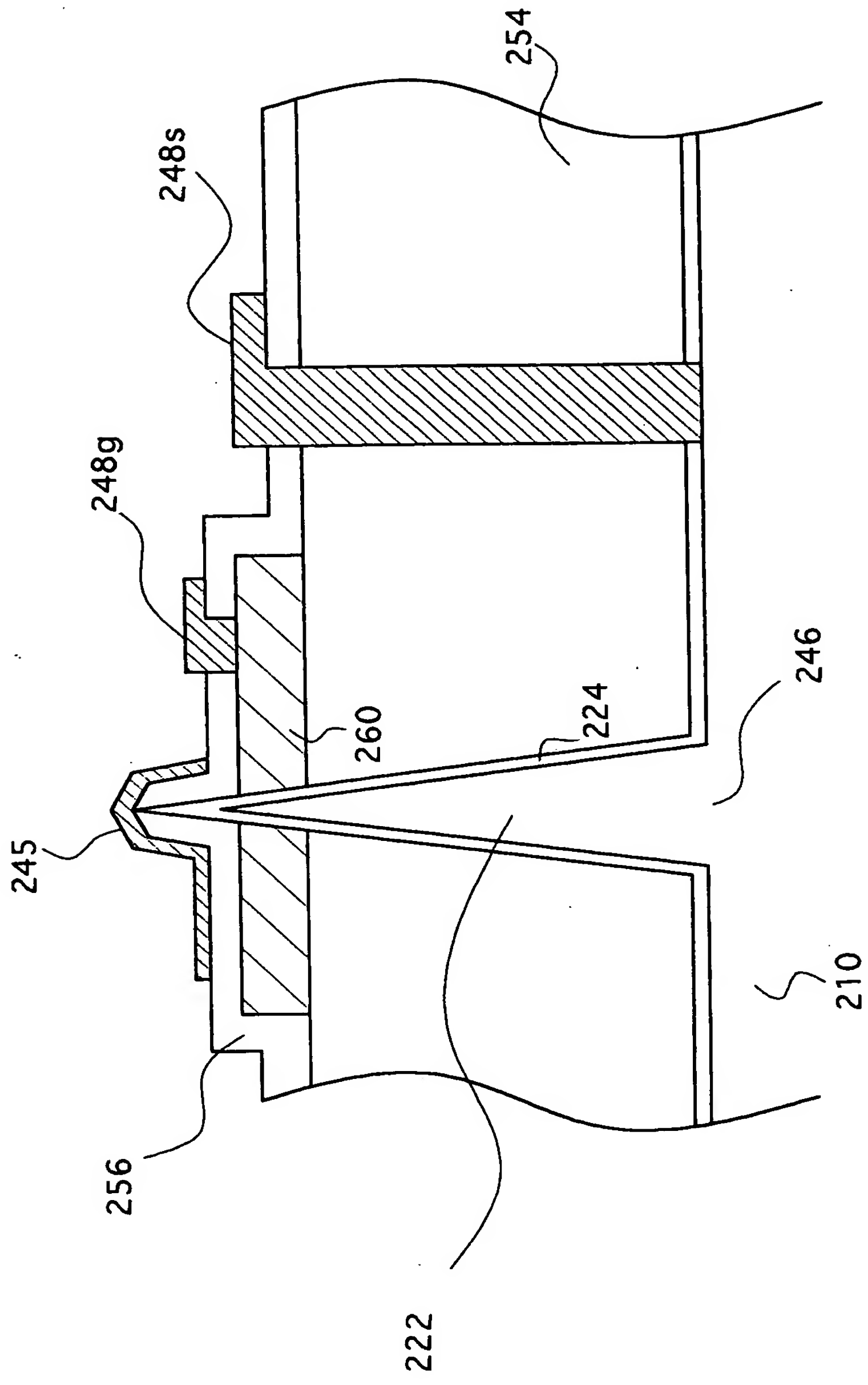


FIG. 21

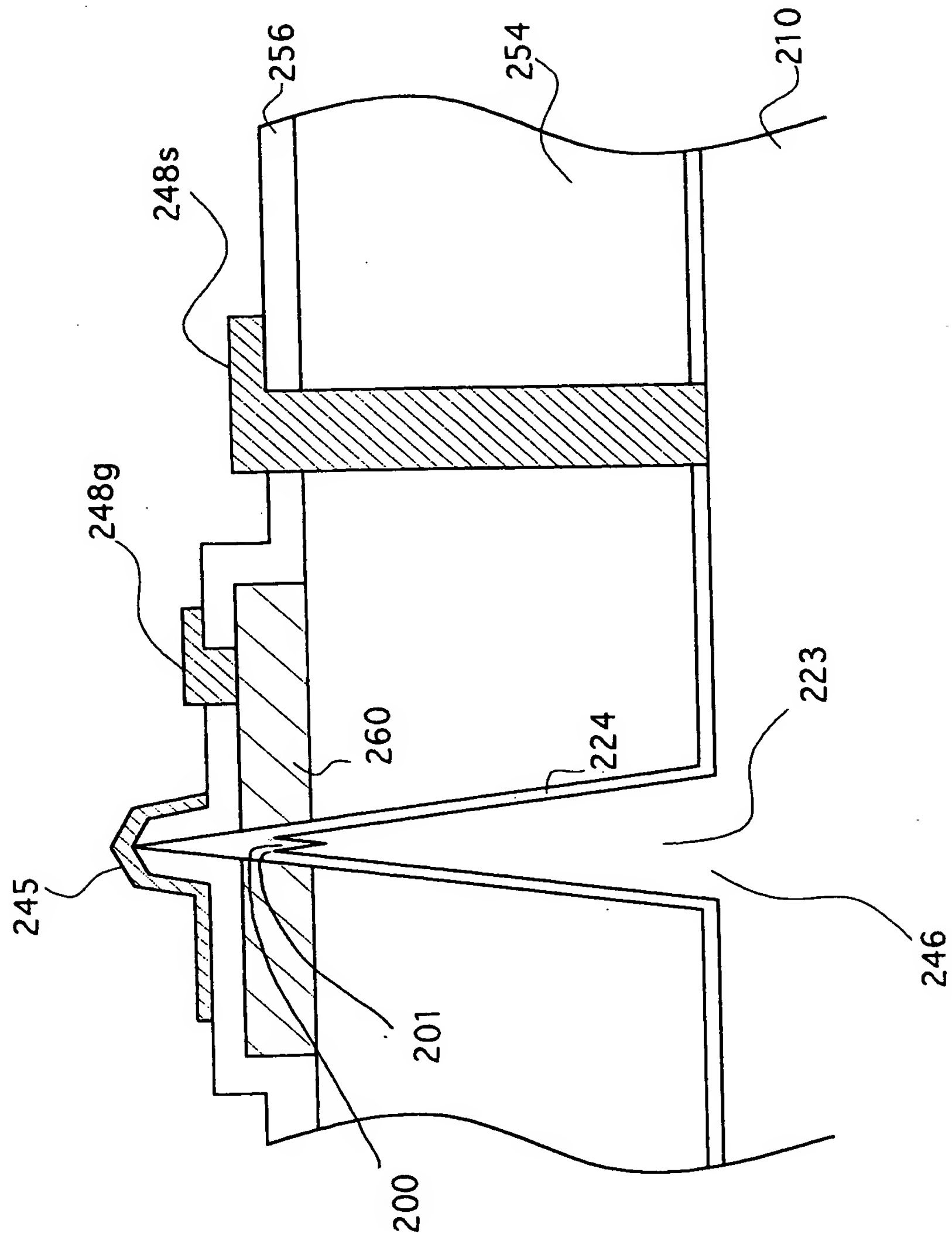
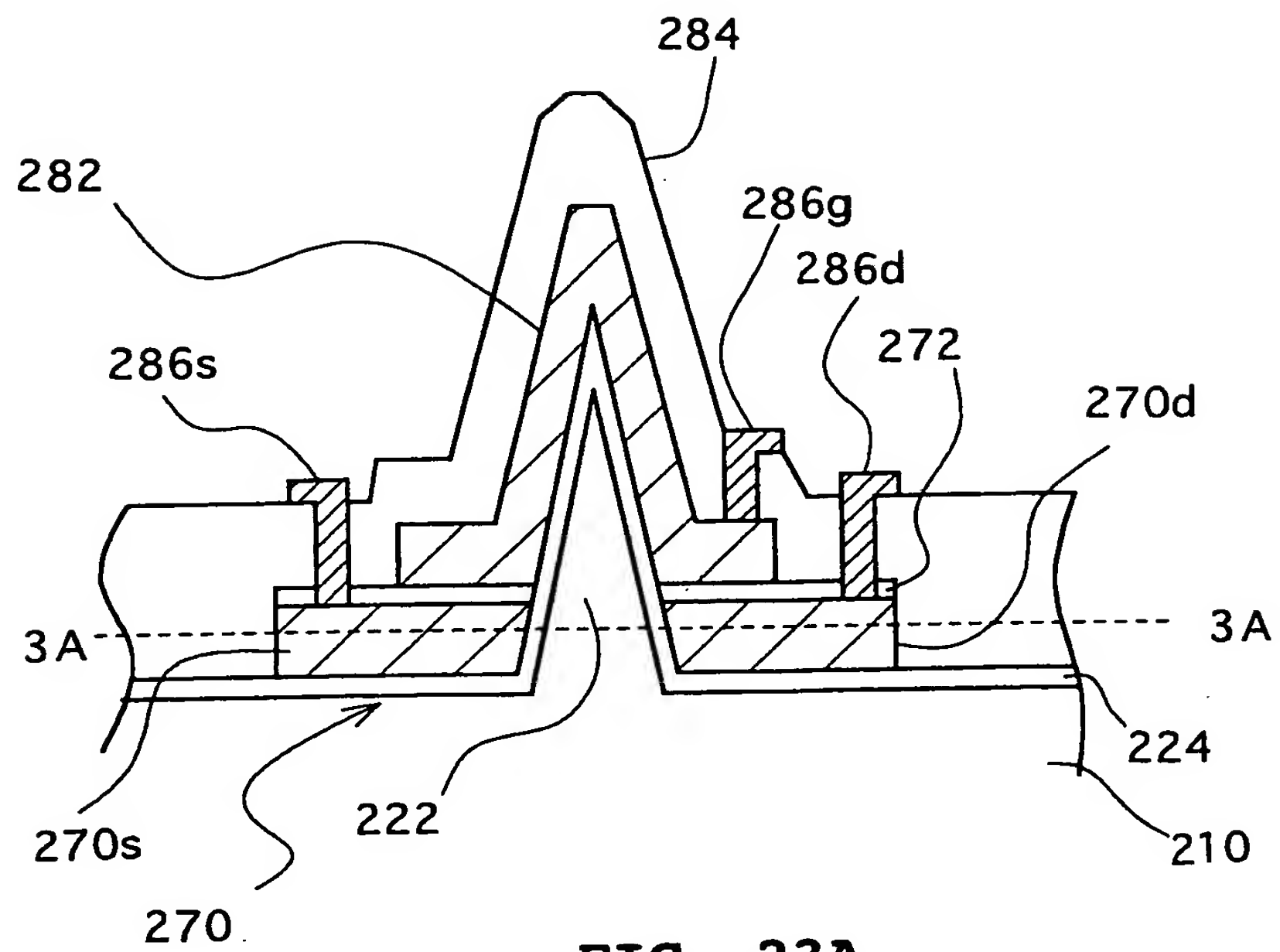
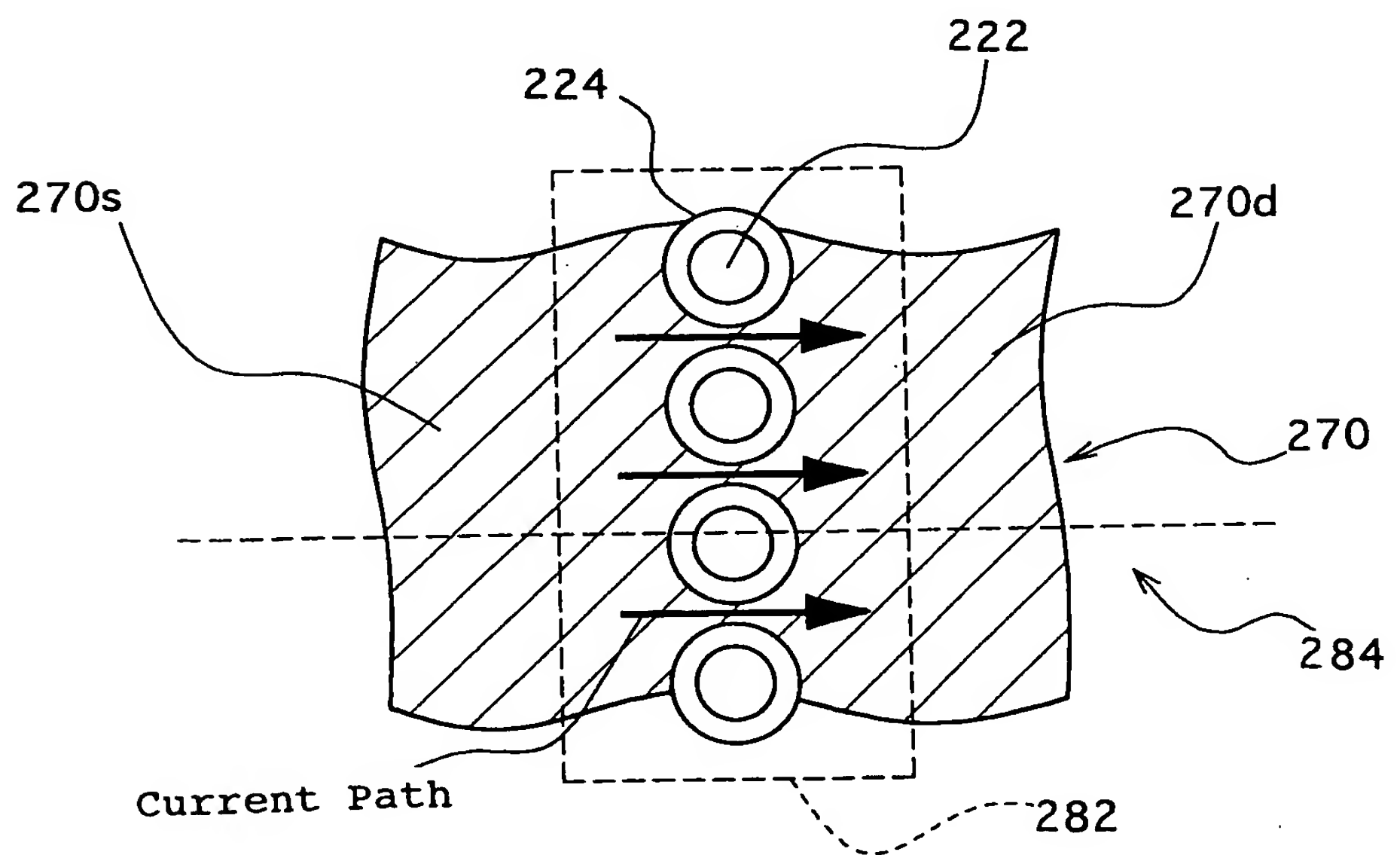


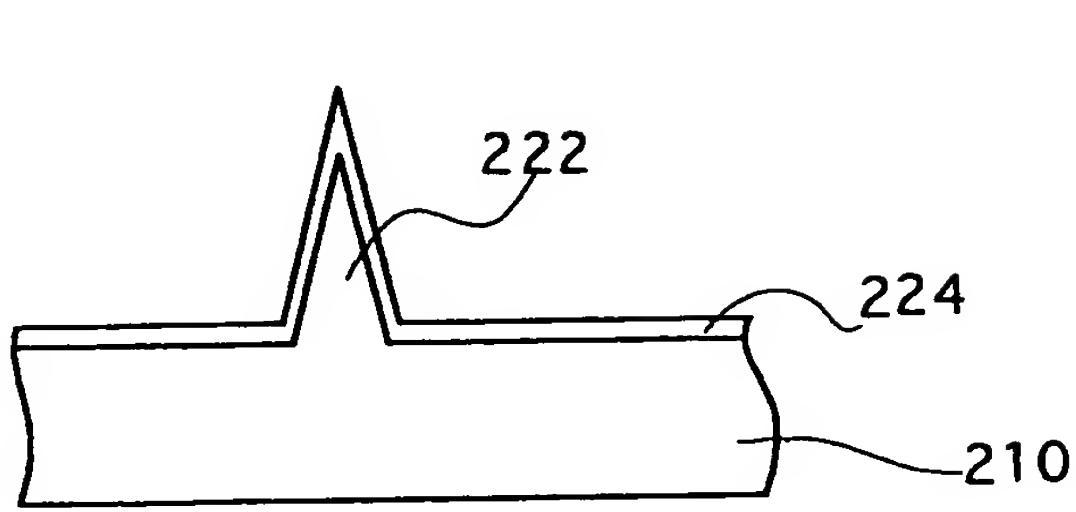
FIG. 22



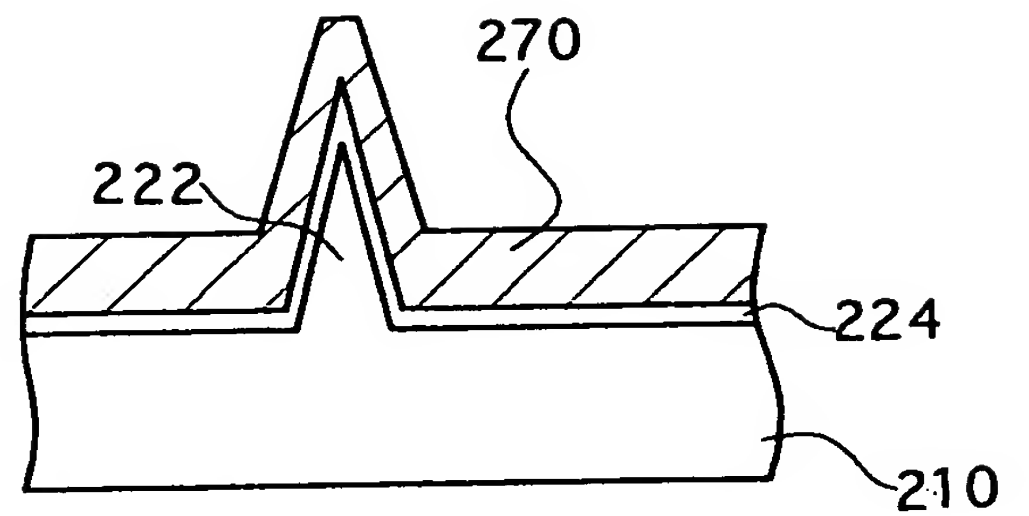
**FIG. 23A**



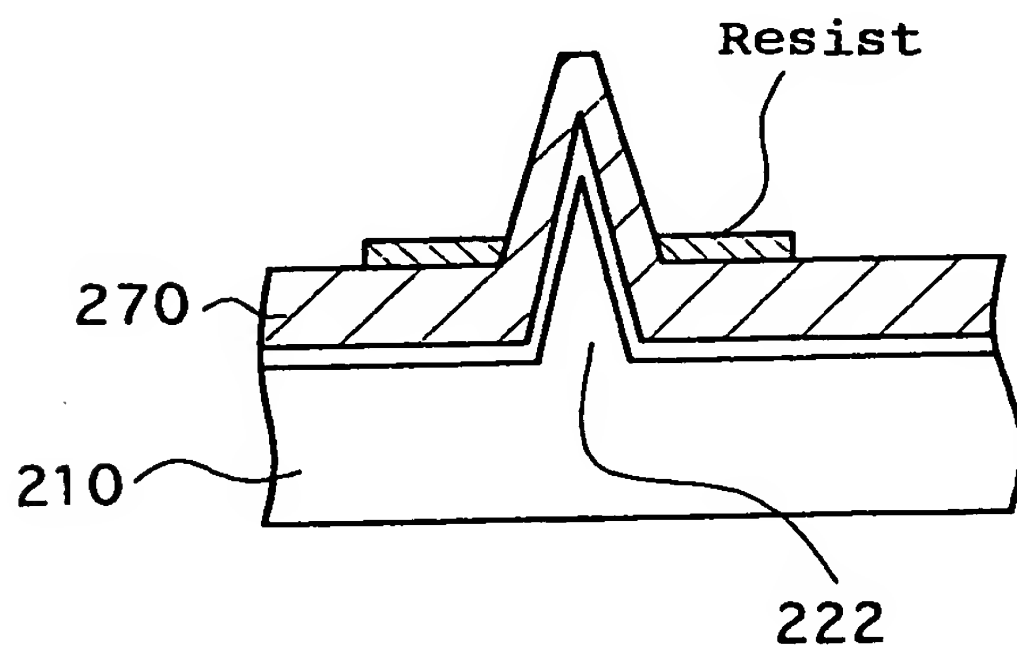
**FIG. 23B**



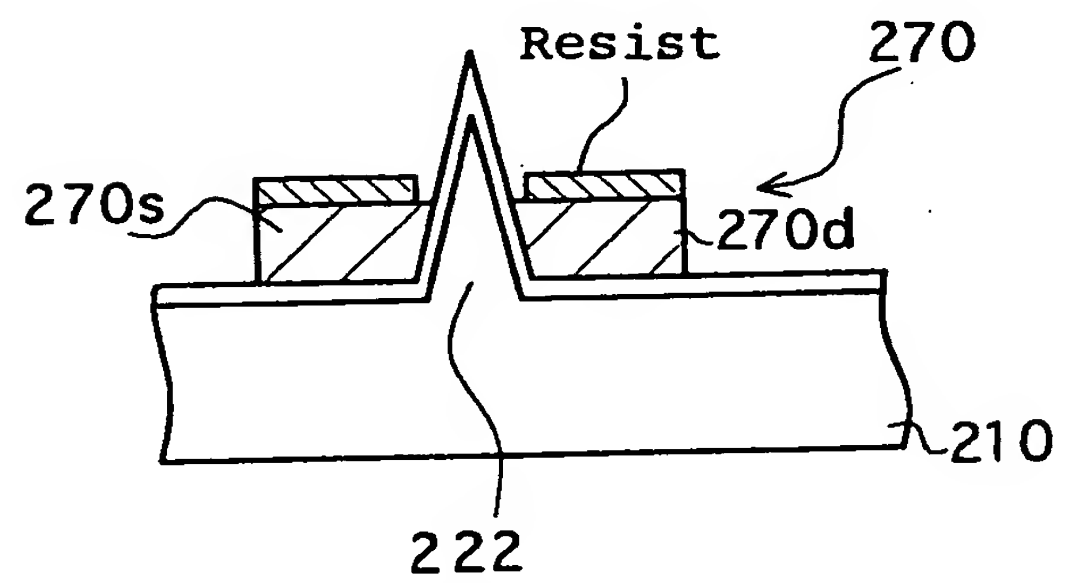
**FIG. 24A**



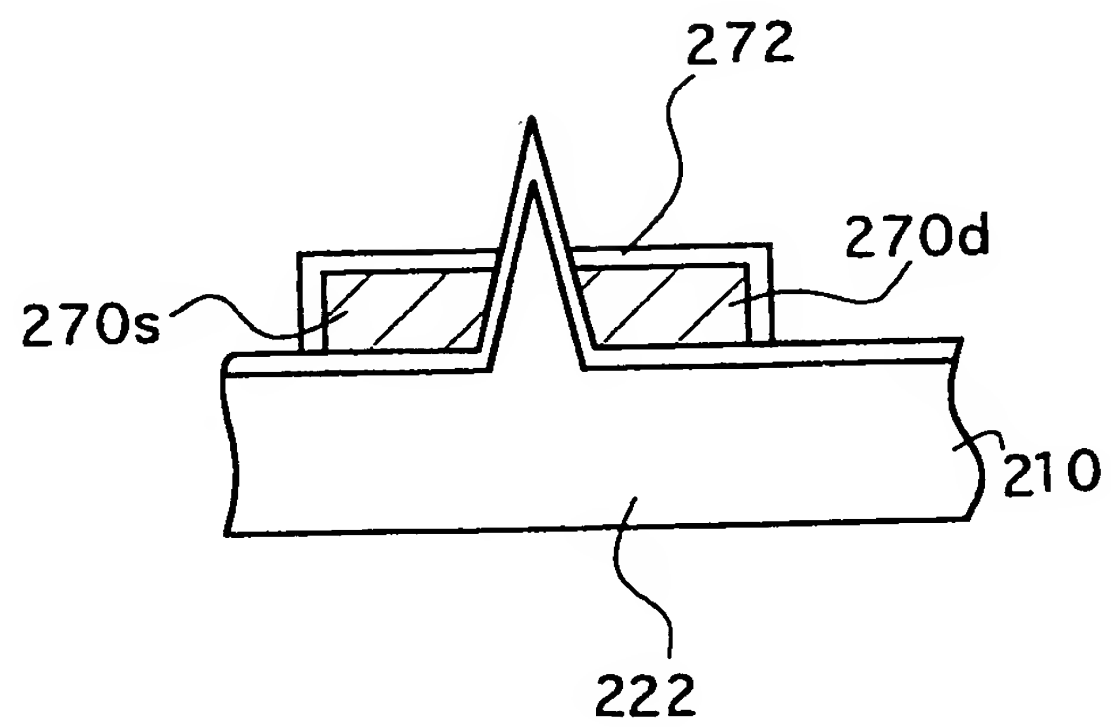
**FIG. 24B**



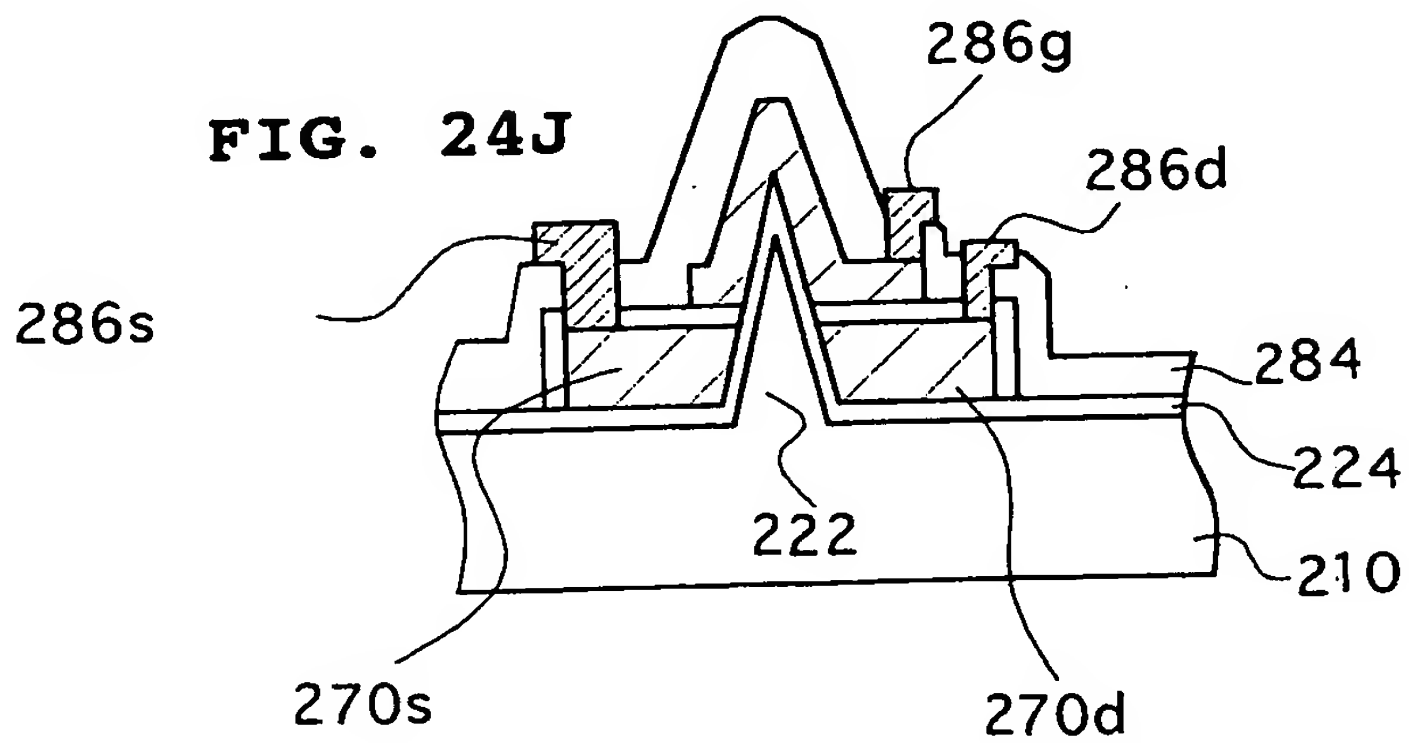
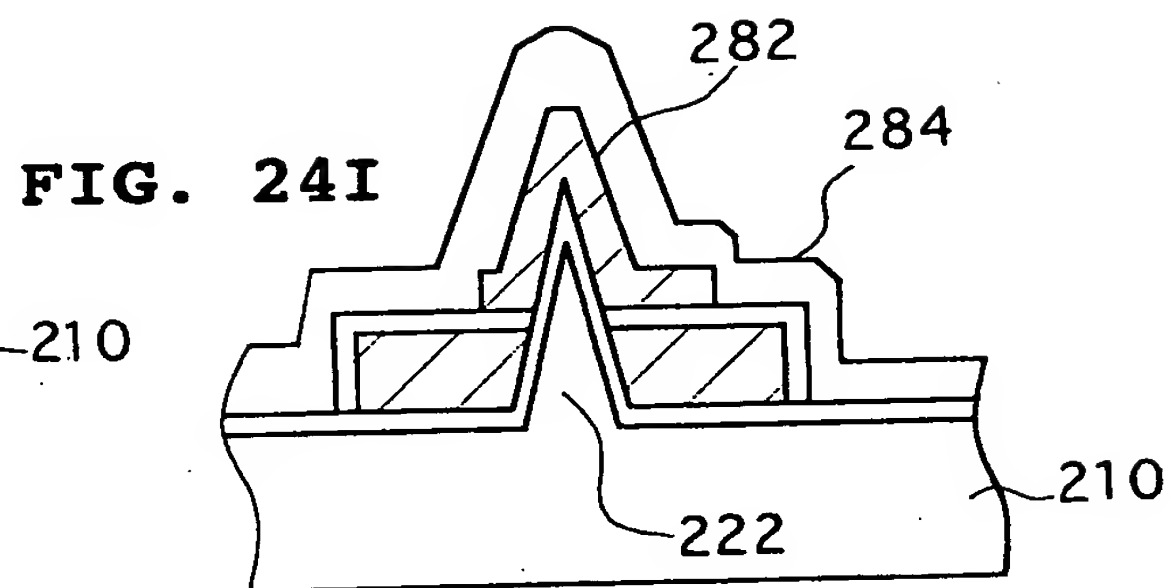
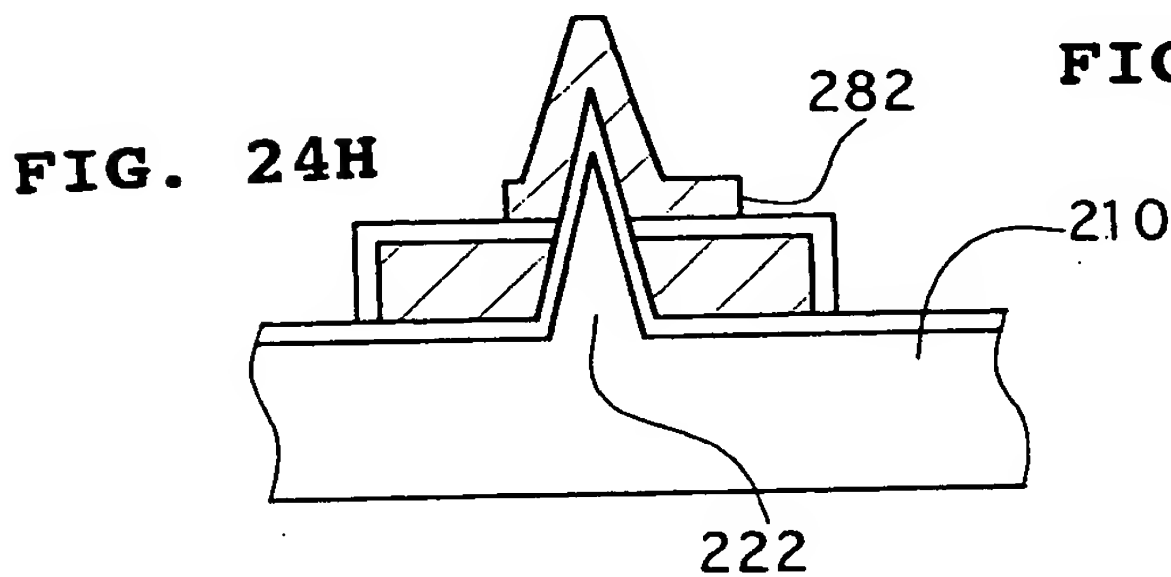
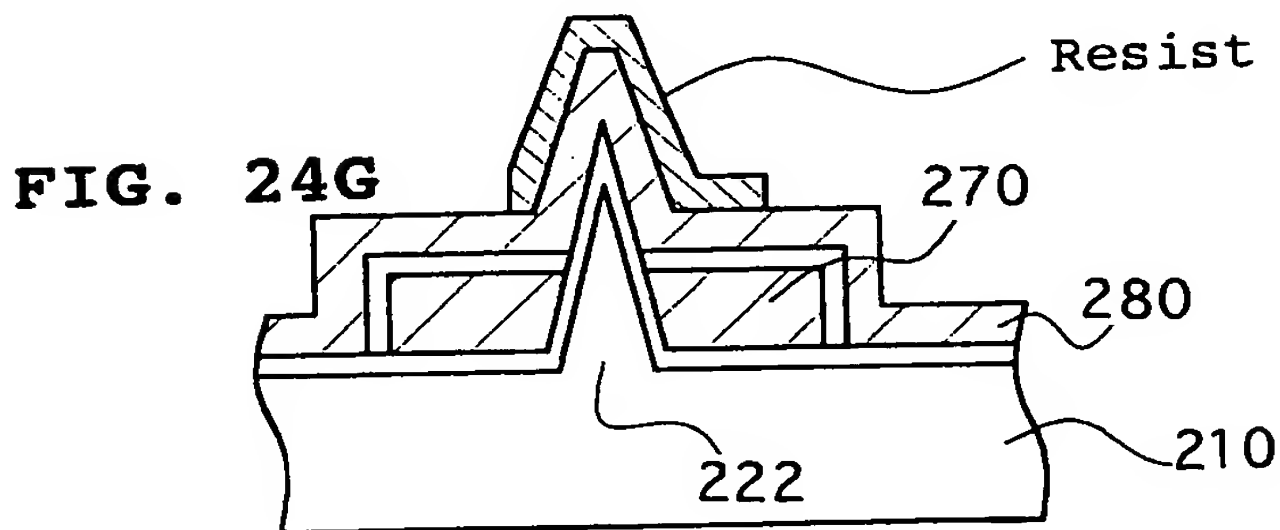
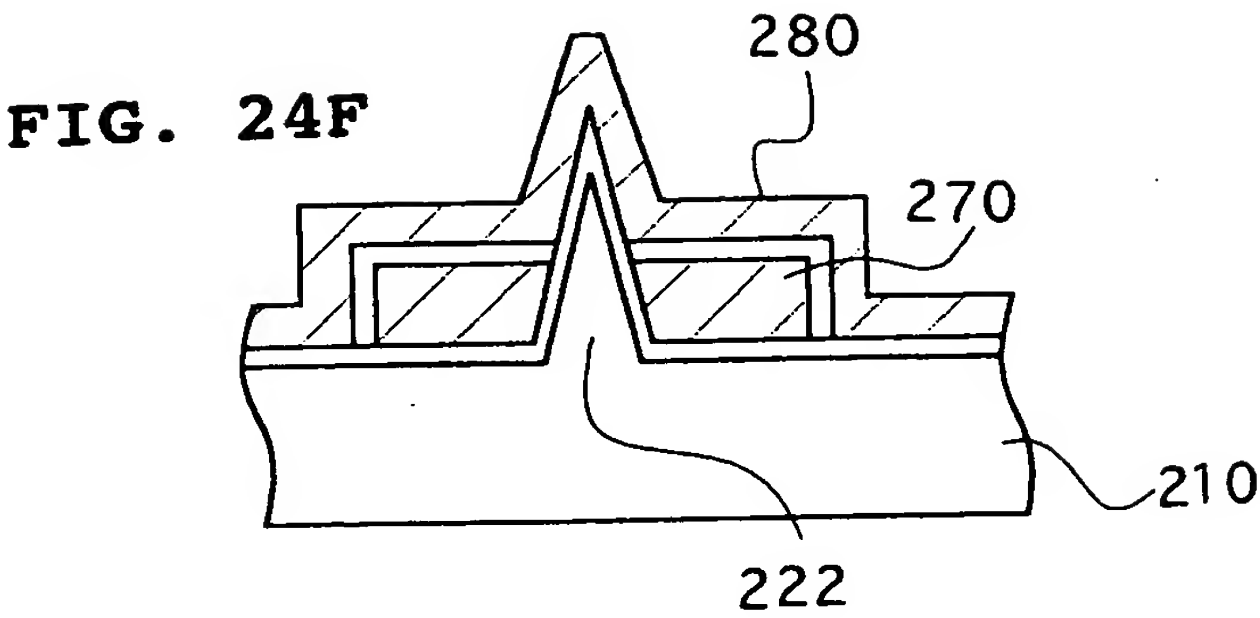
**FIG. 24C**

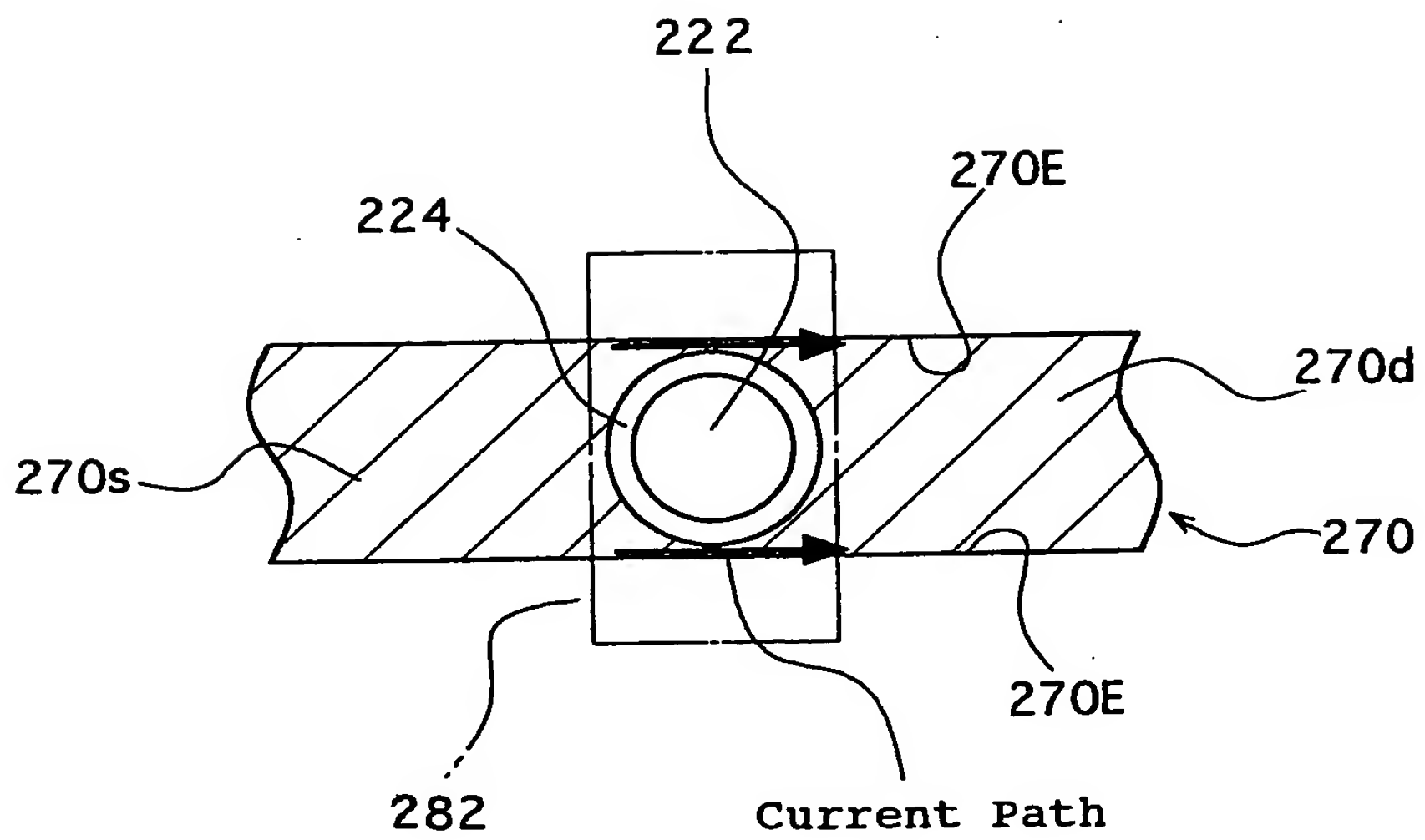


**FIG. 24D**

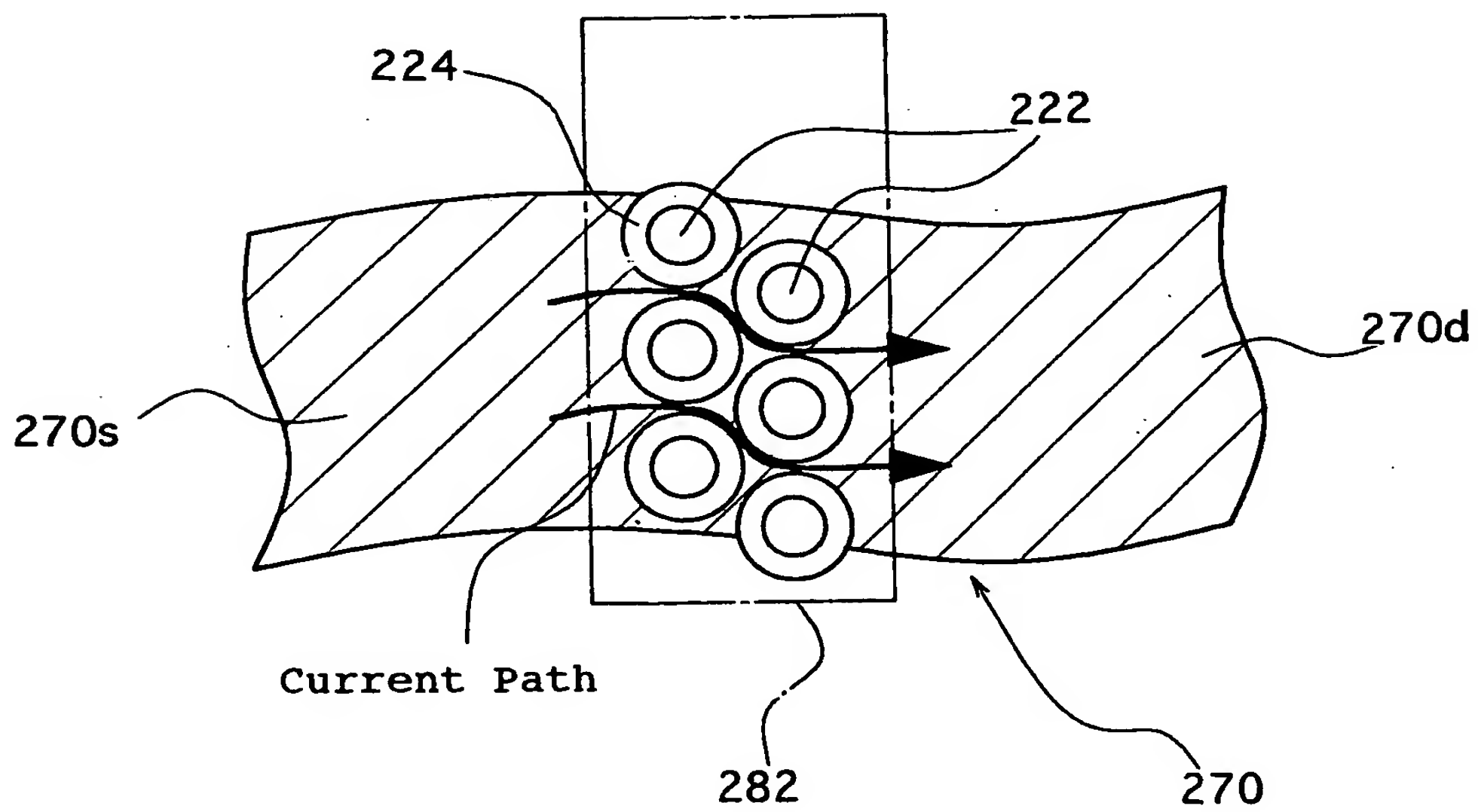


**FIG. 24E**

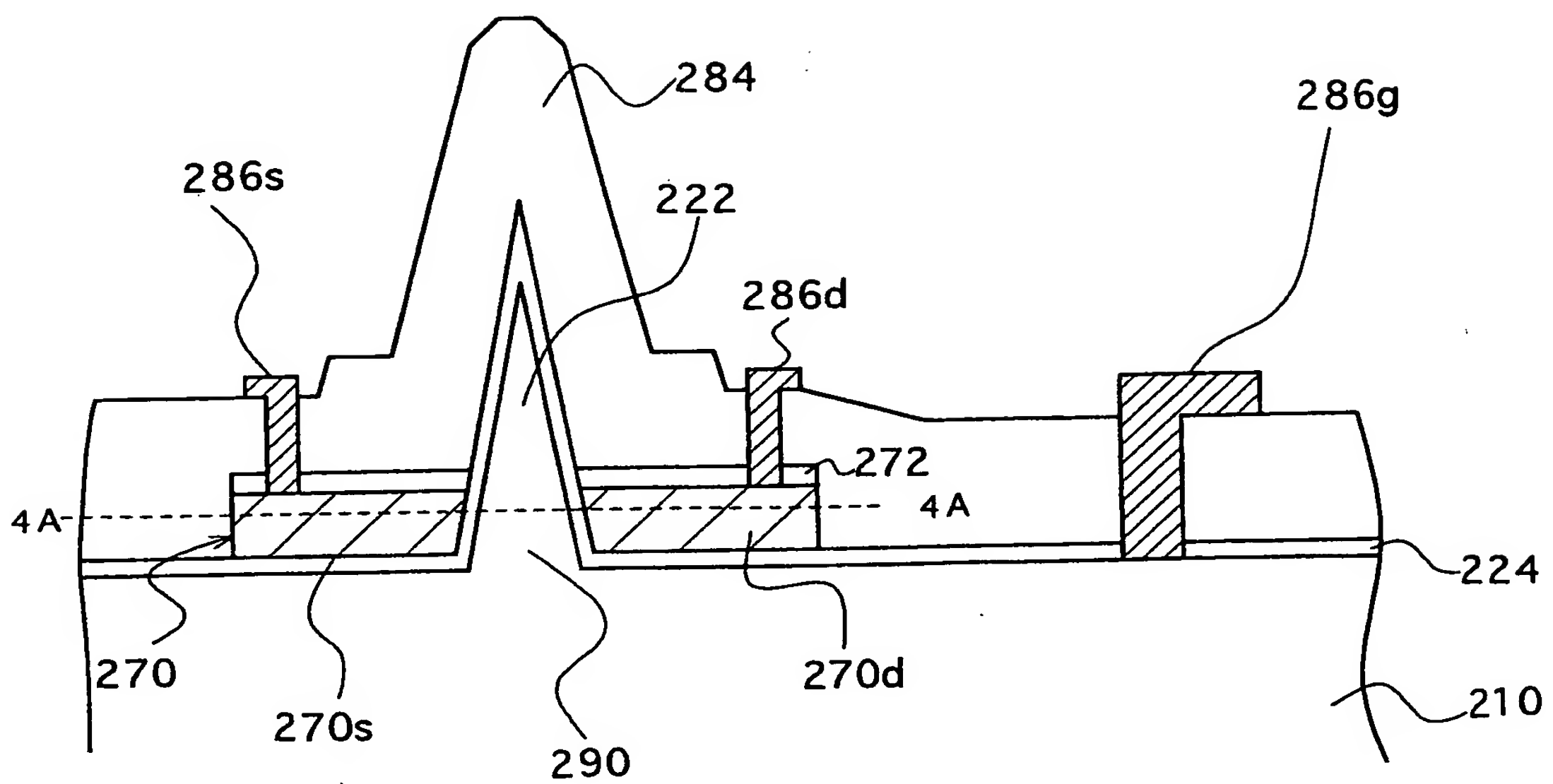




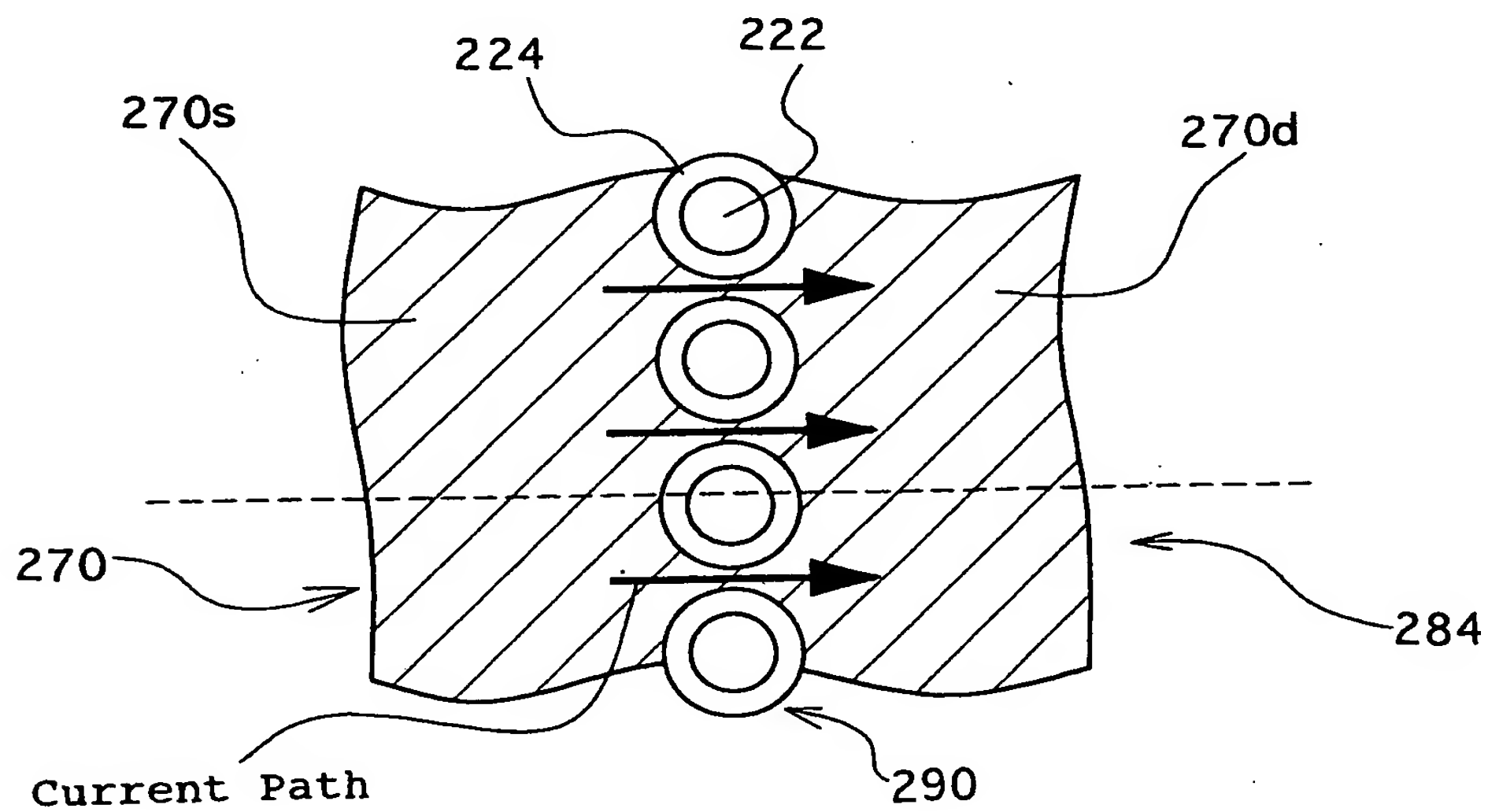
**FIG. 25A**



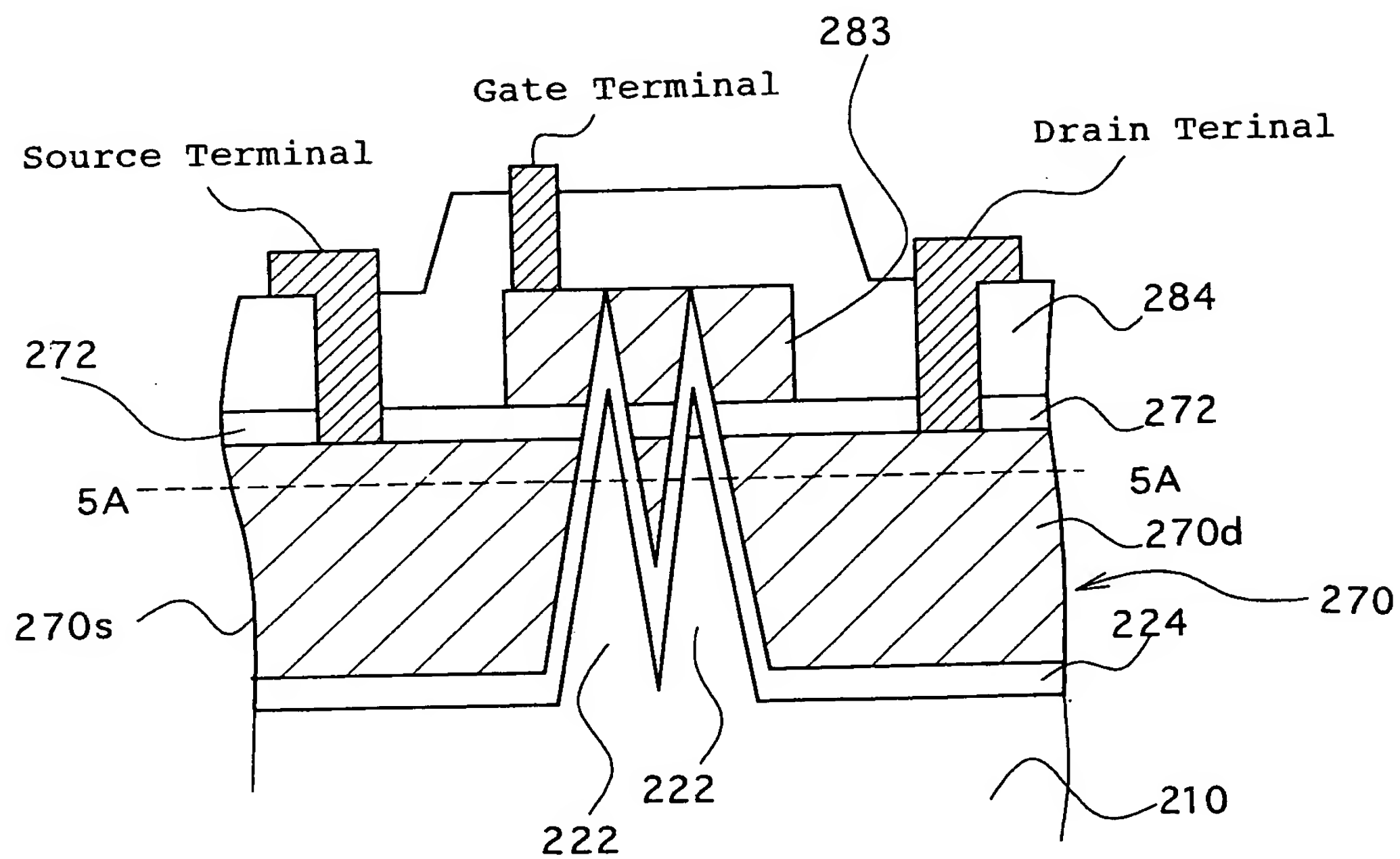
**FIG. 25B**



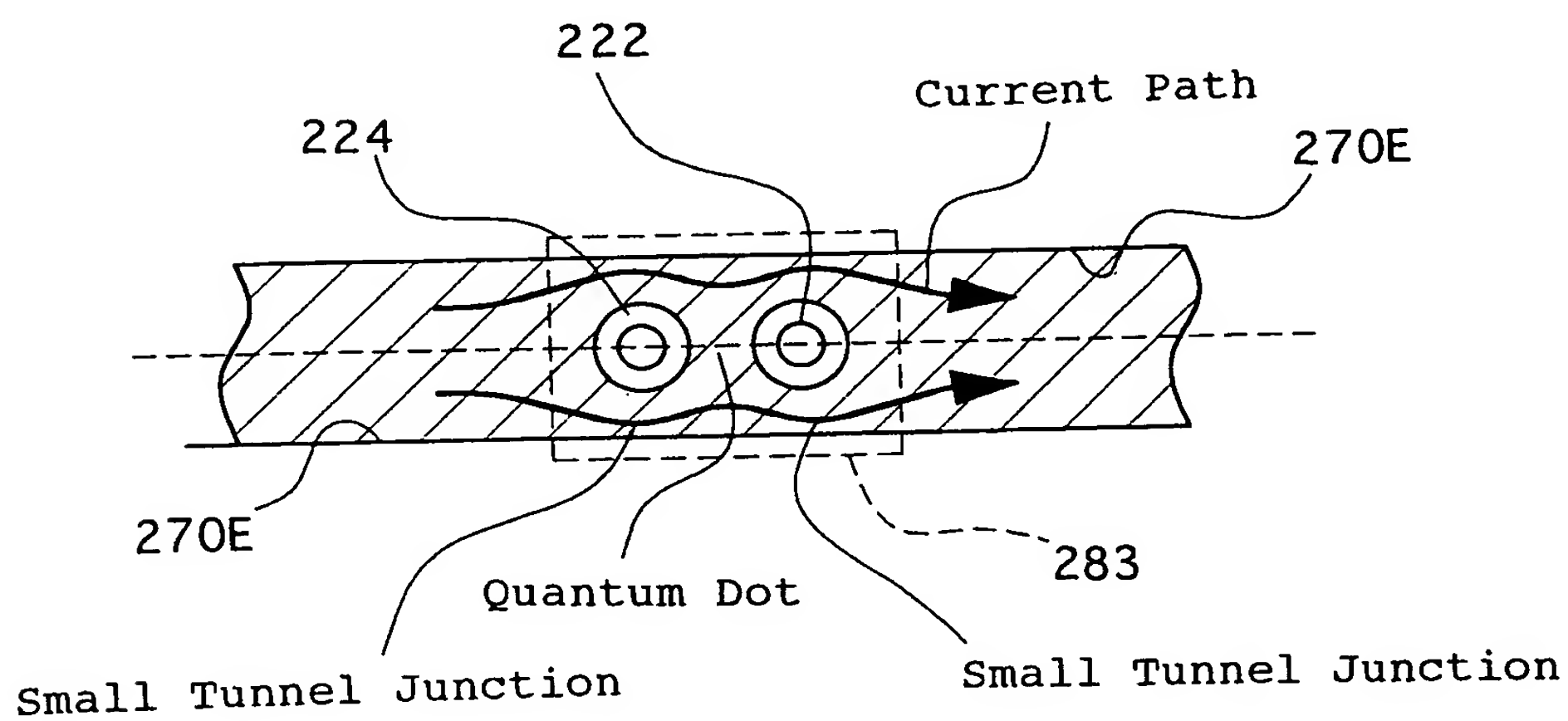
**FIG. 26A**



**FIG. 26B**

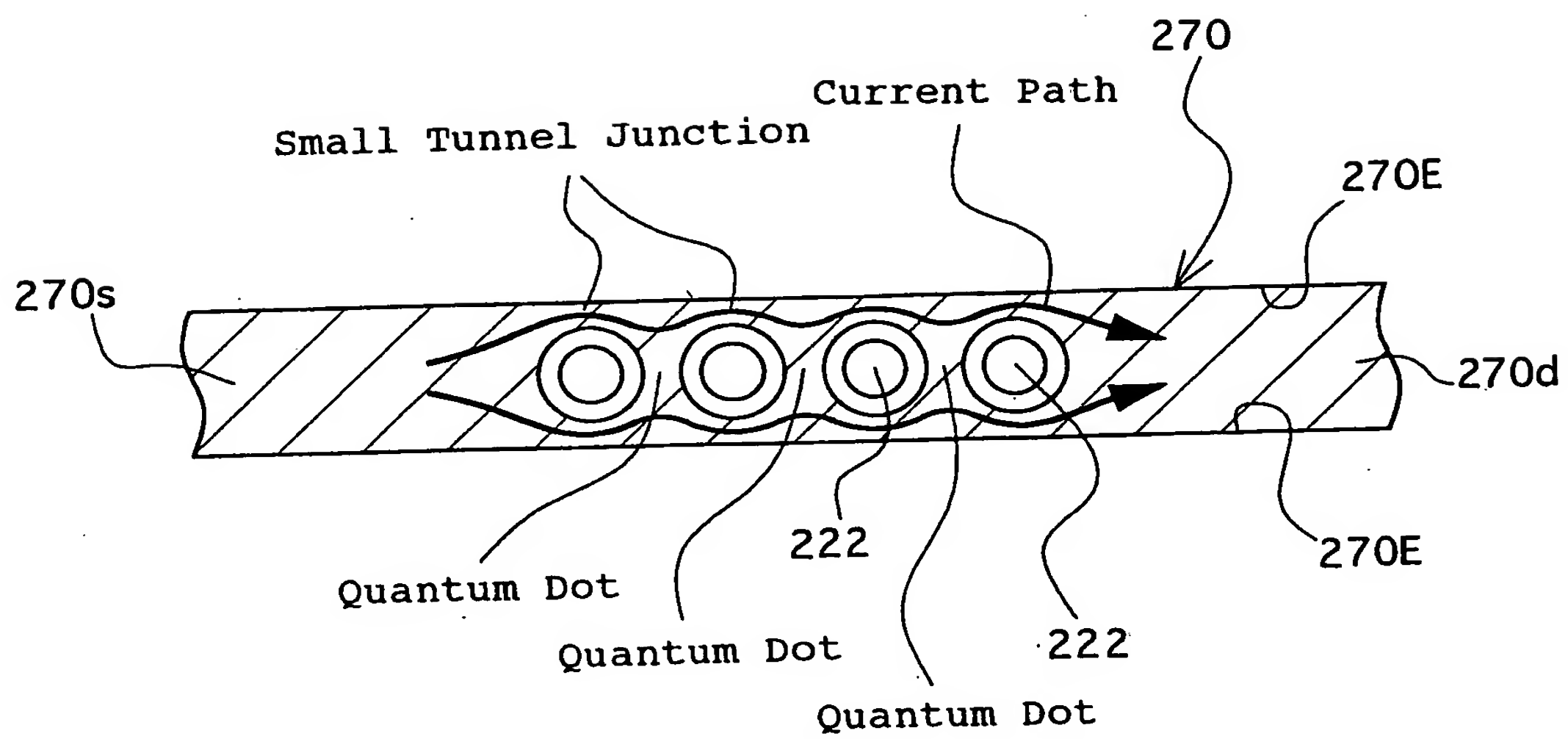


**FIG. 27A**

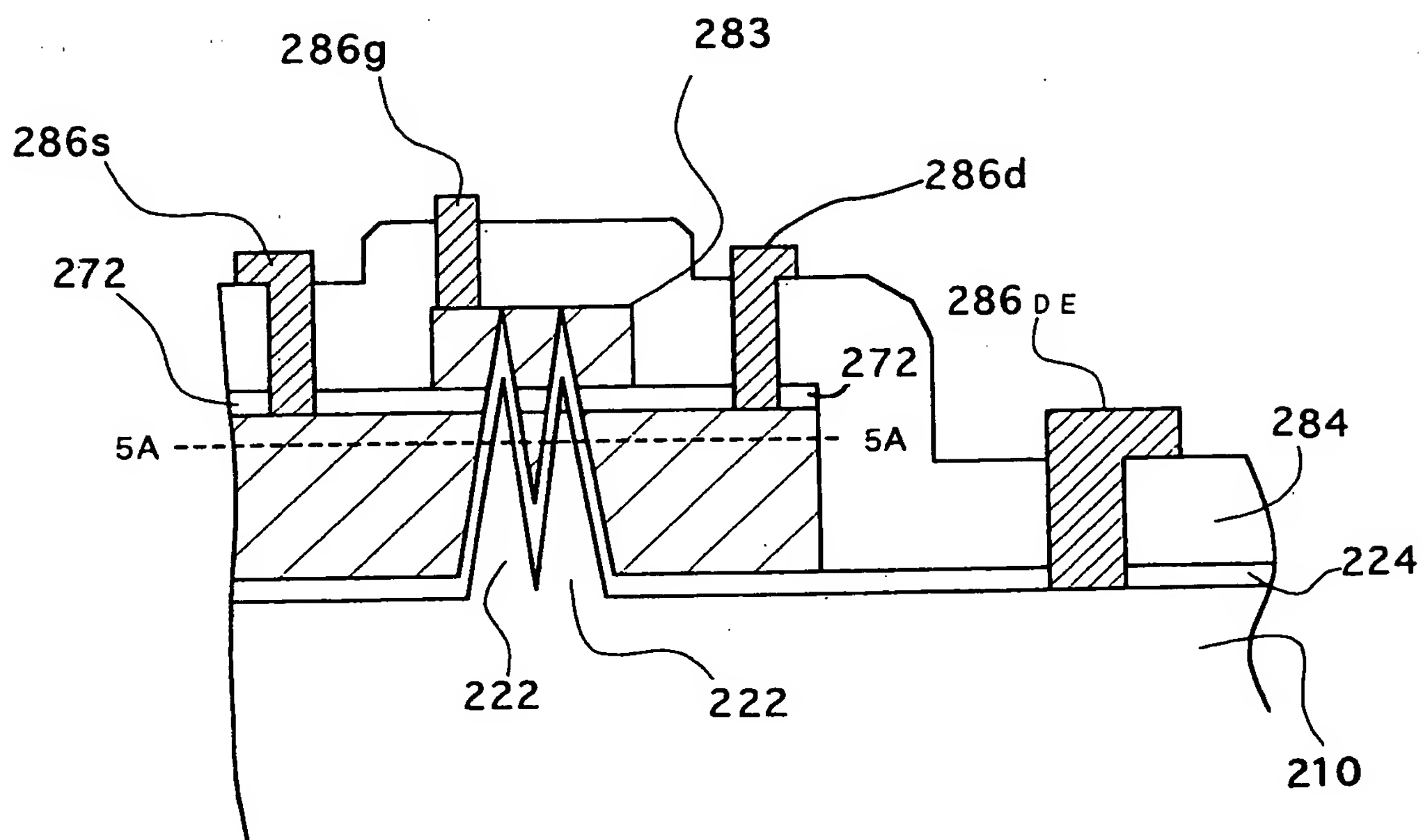


**FIG. 27B**

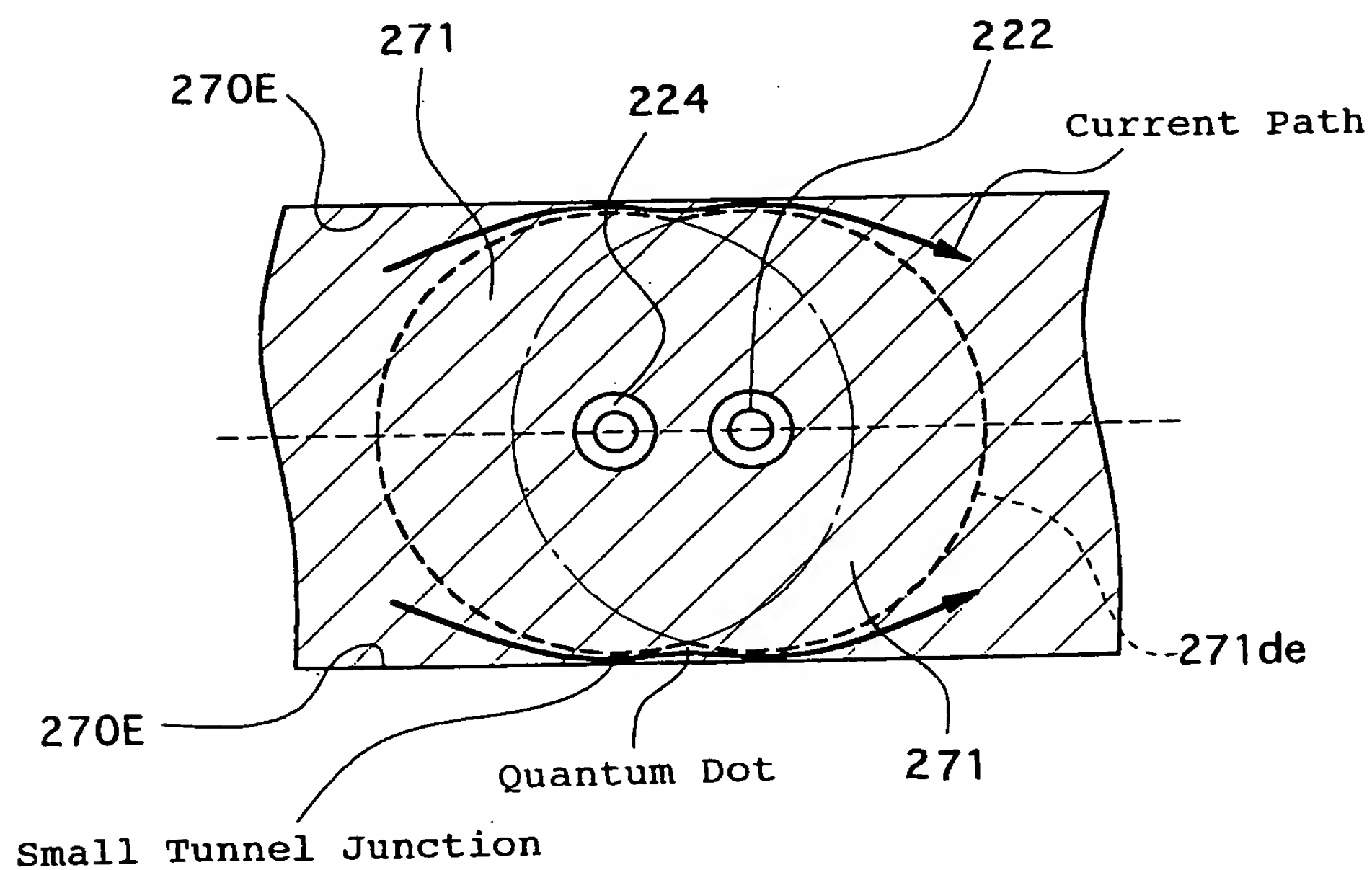




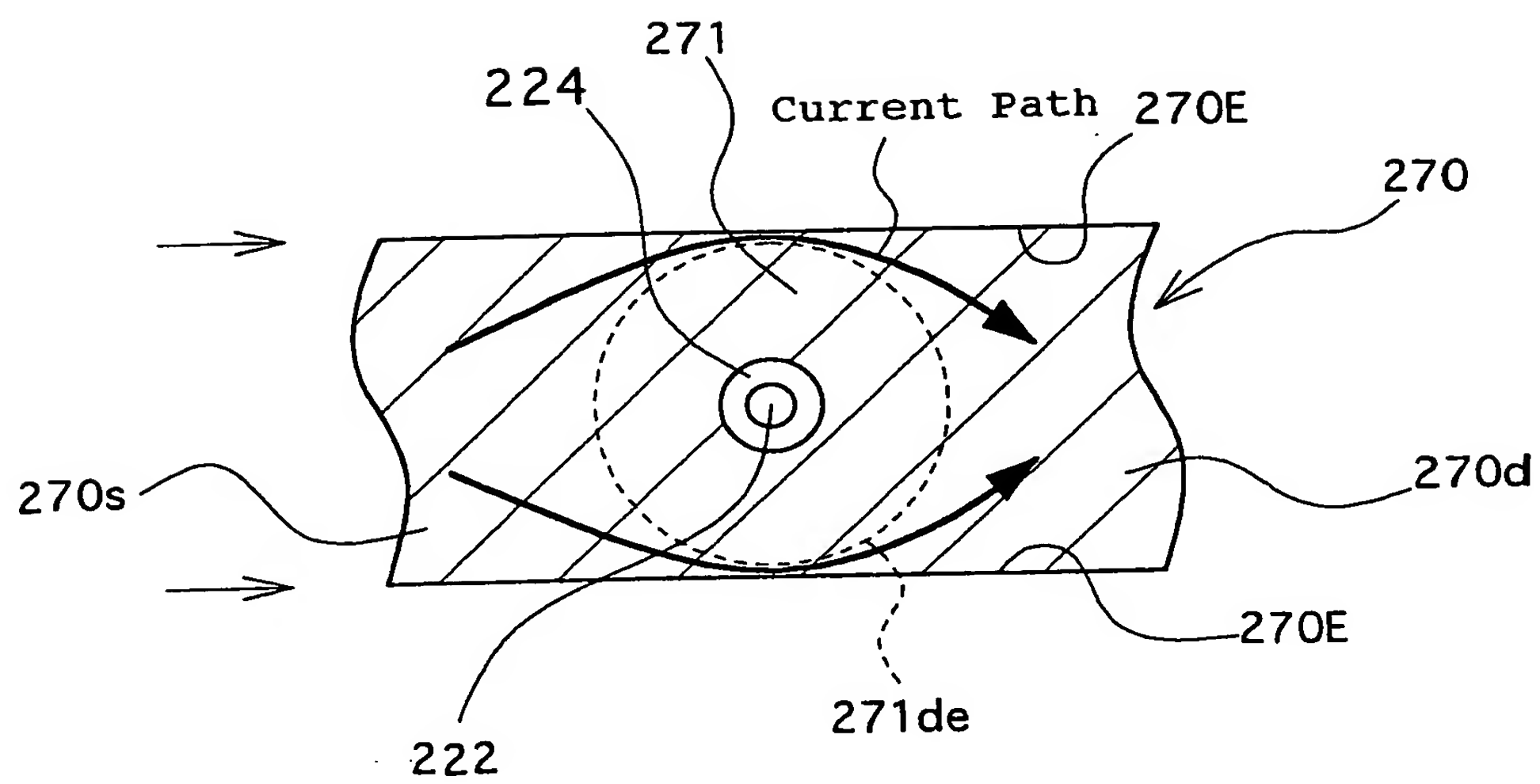
**FIG. 28**



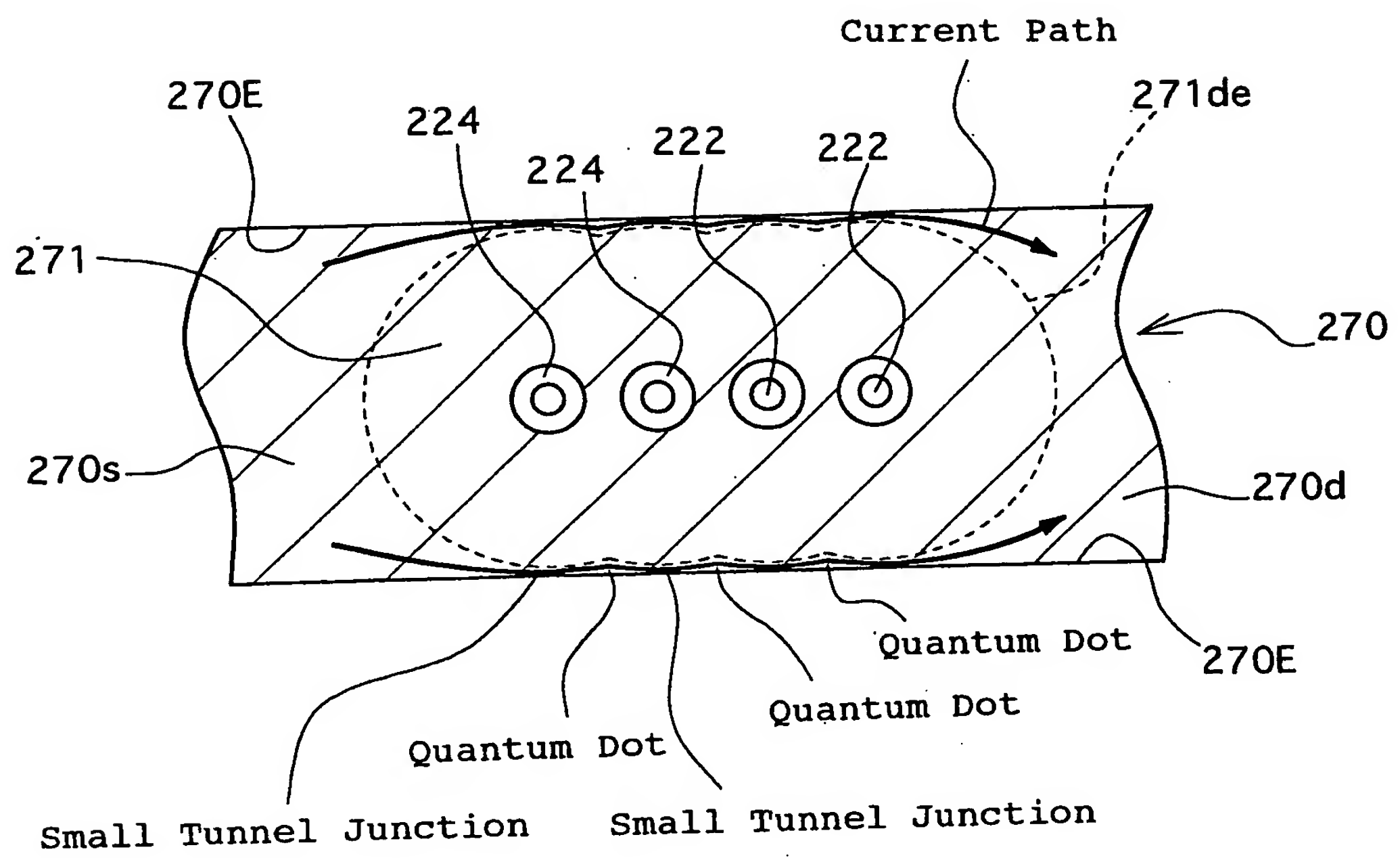
**FIG. 29A**



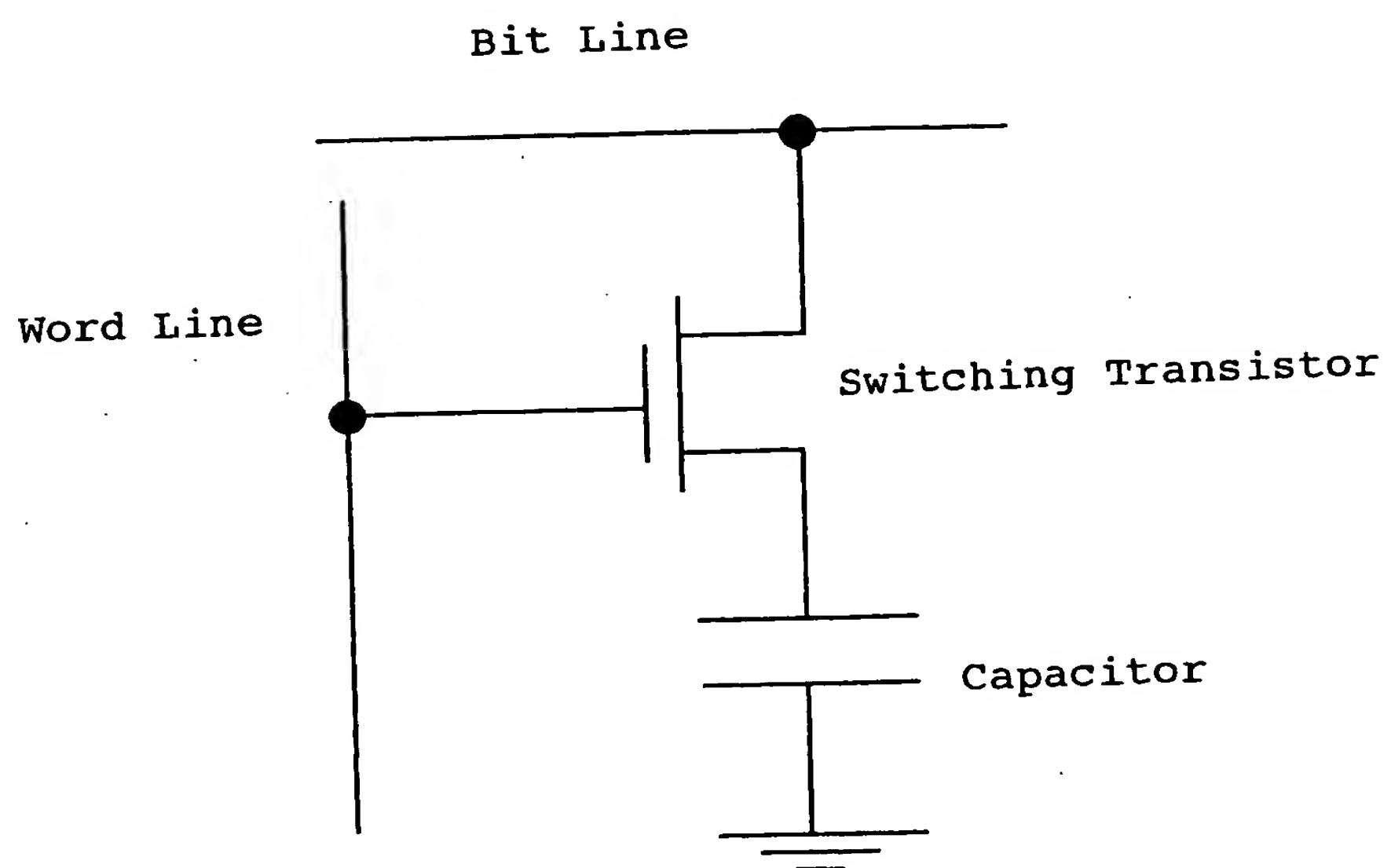
**FIG. 29B**



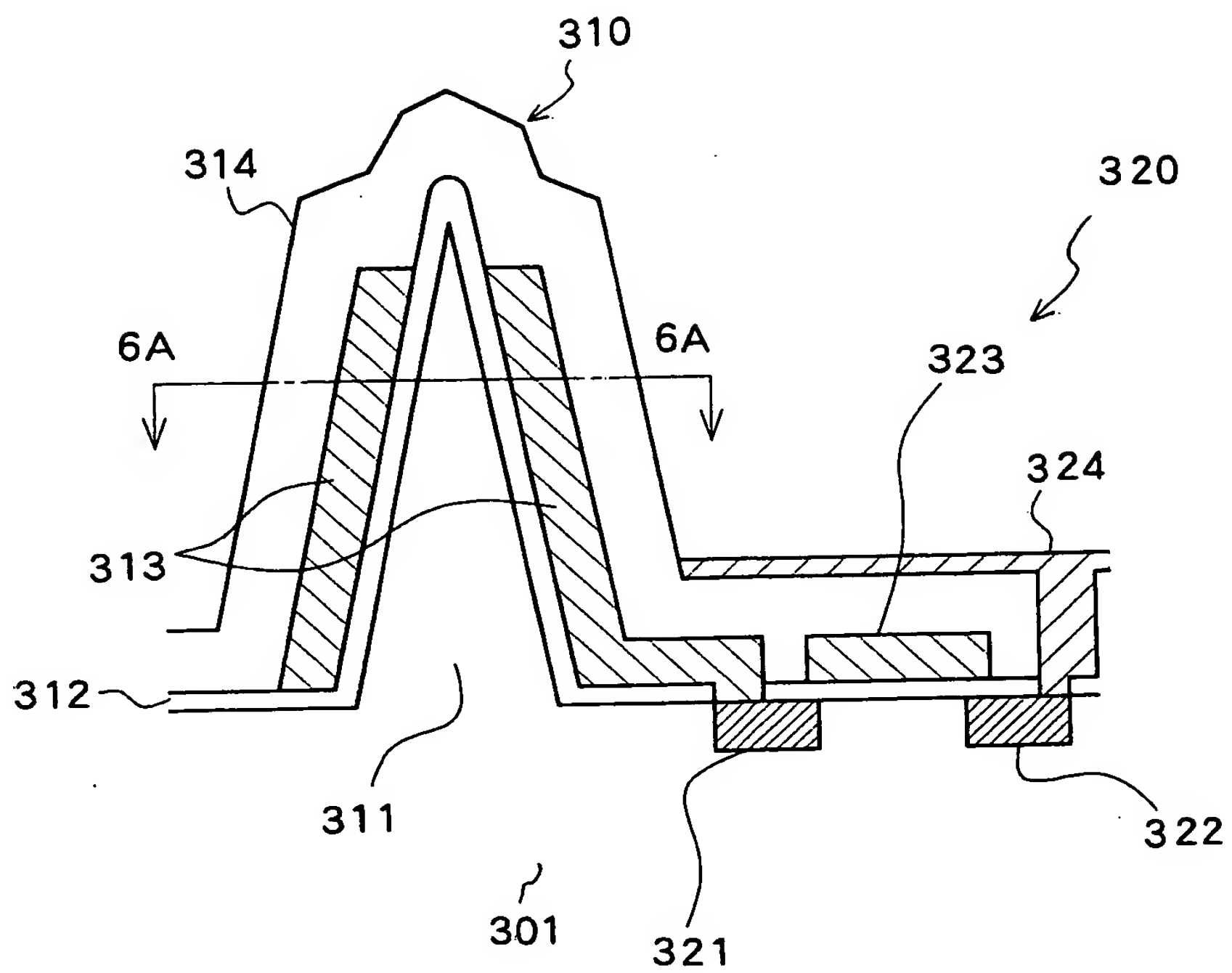
**FIG. 30**



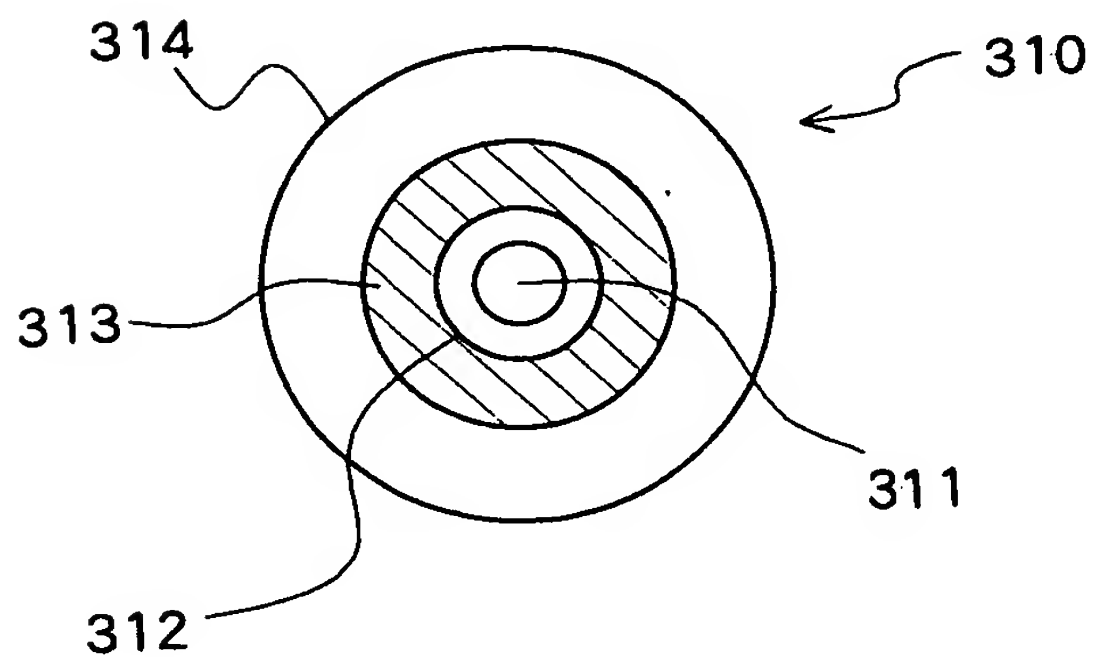
**FIG. 31**



**FIG. 32 PRIOR ART**



**FIG. 33A**



**FIG. 33B**

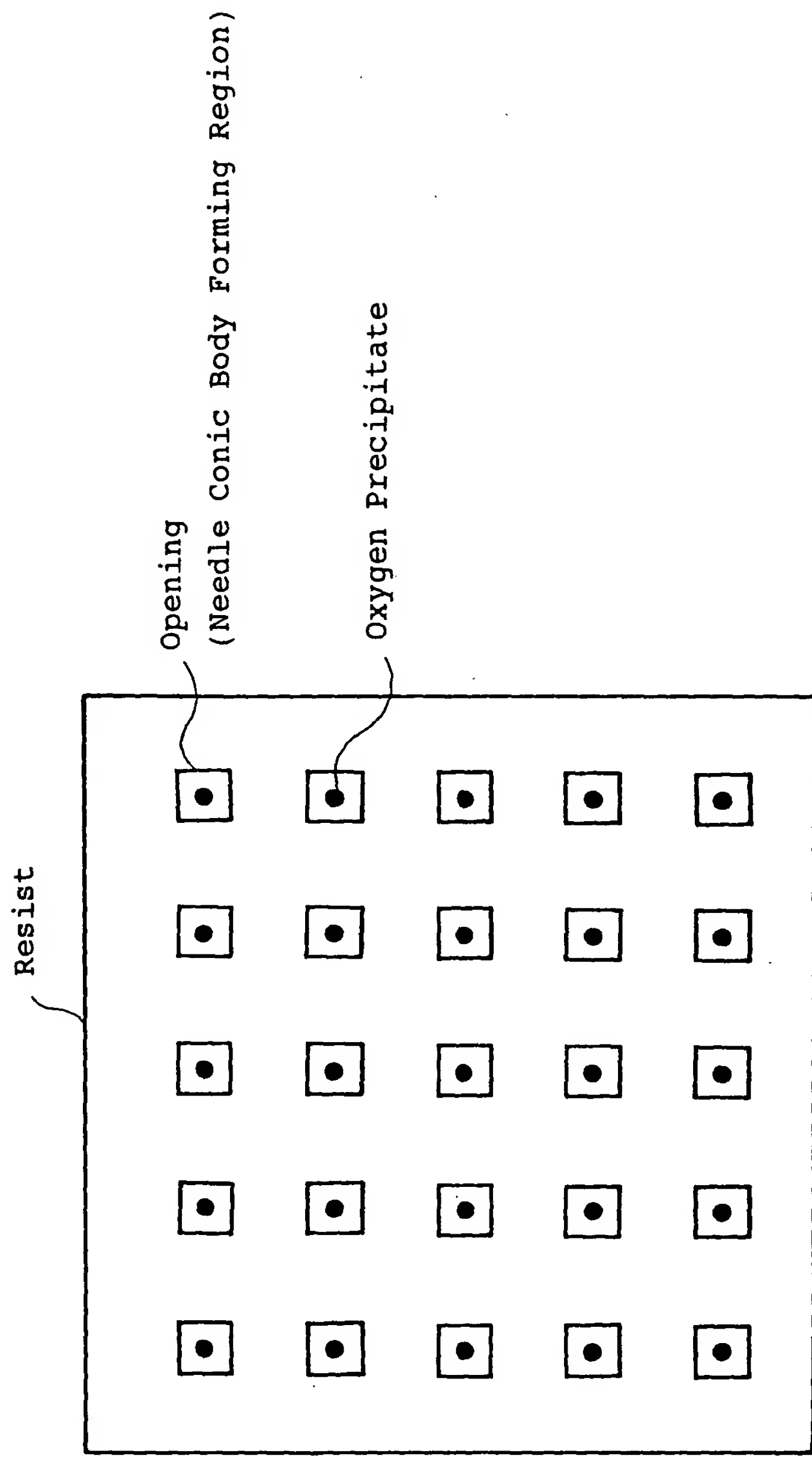
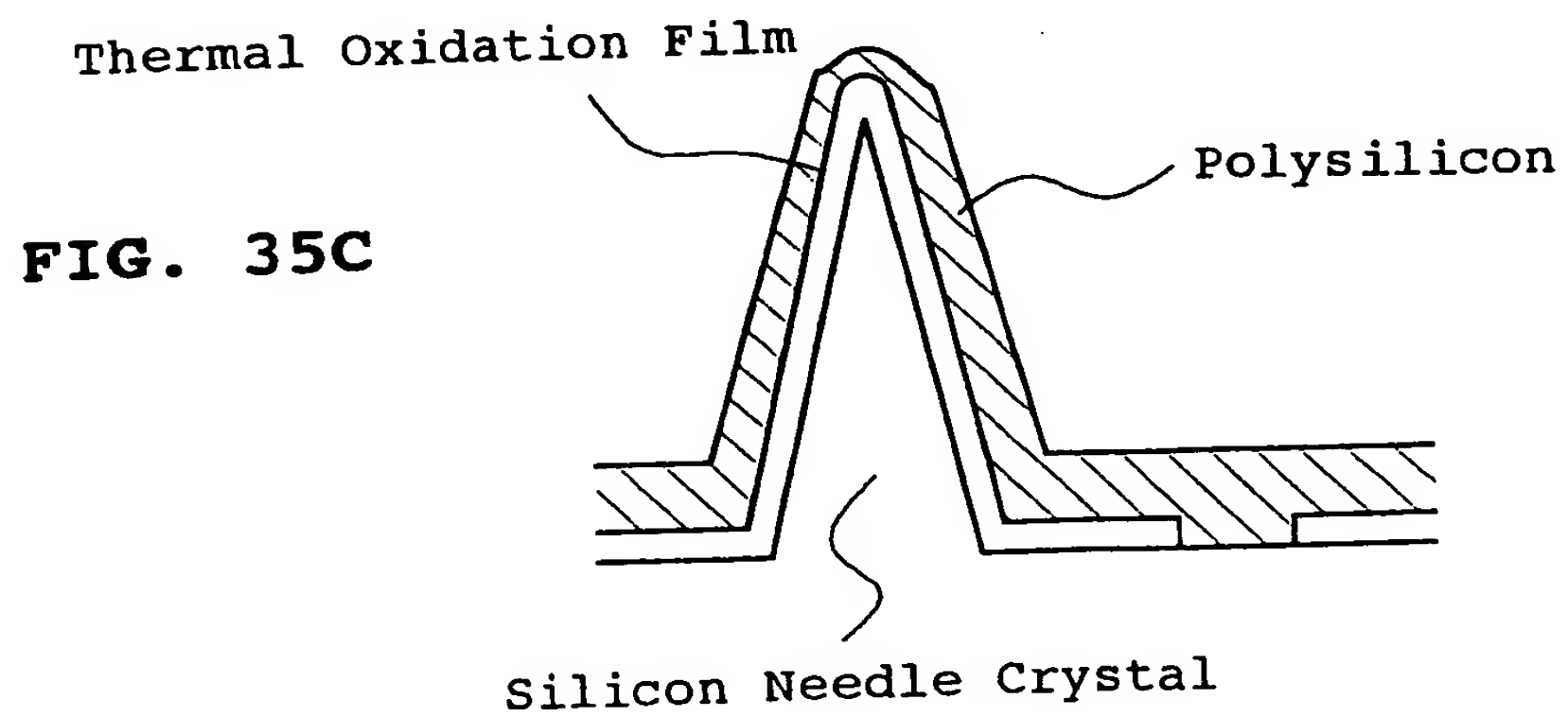
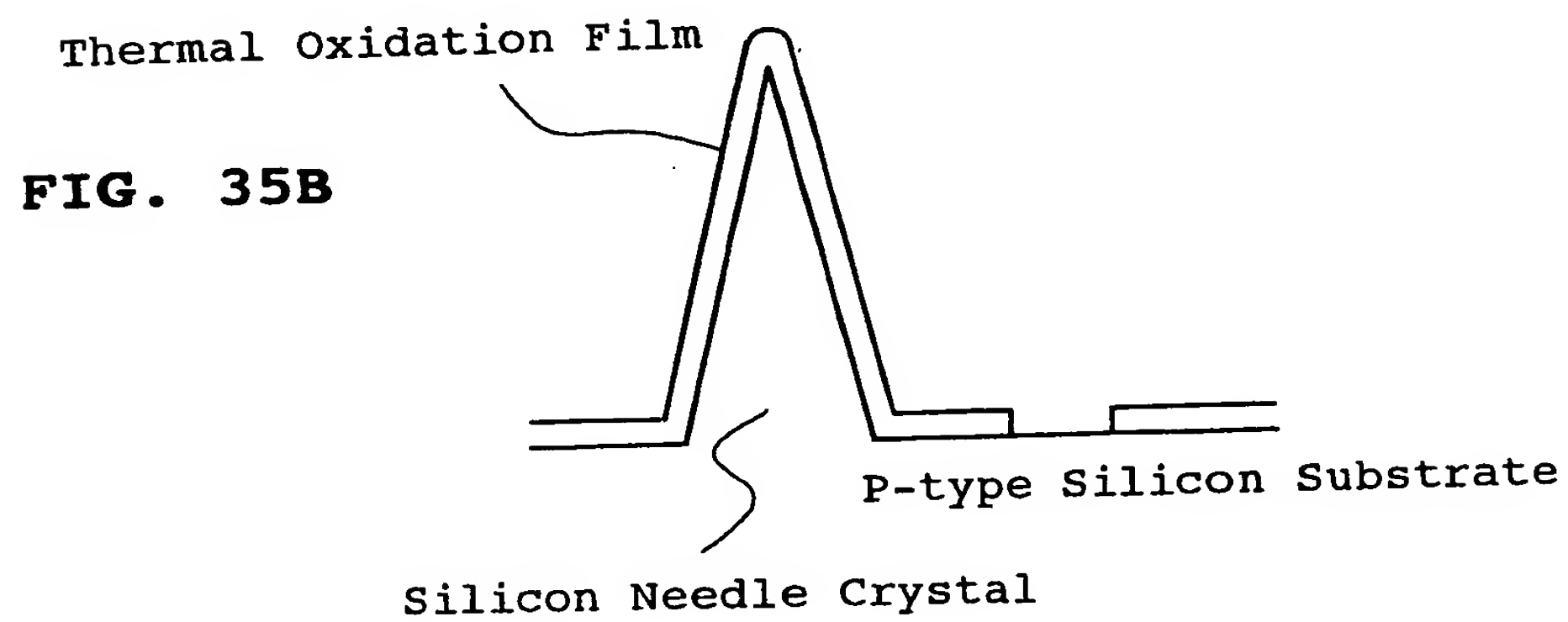
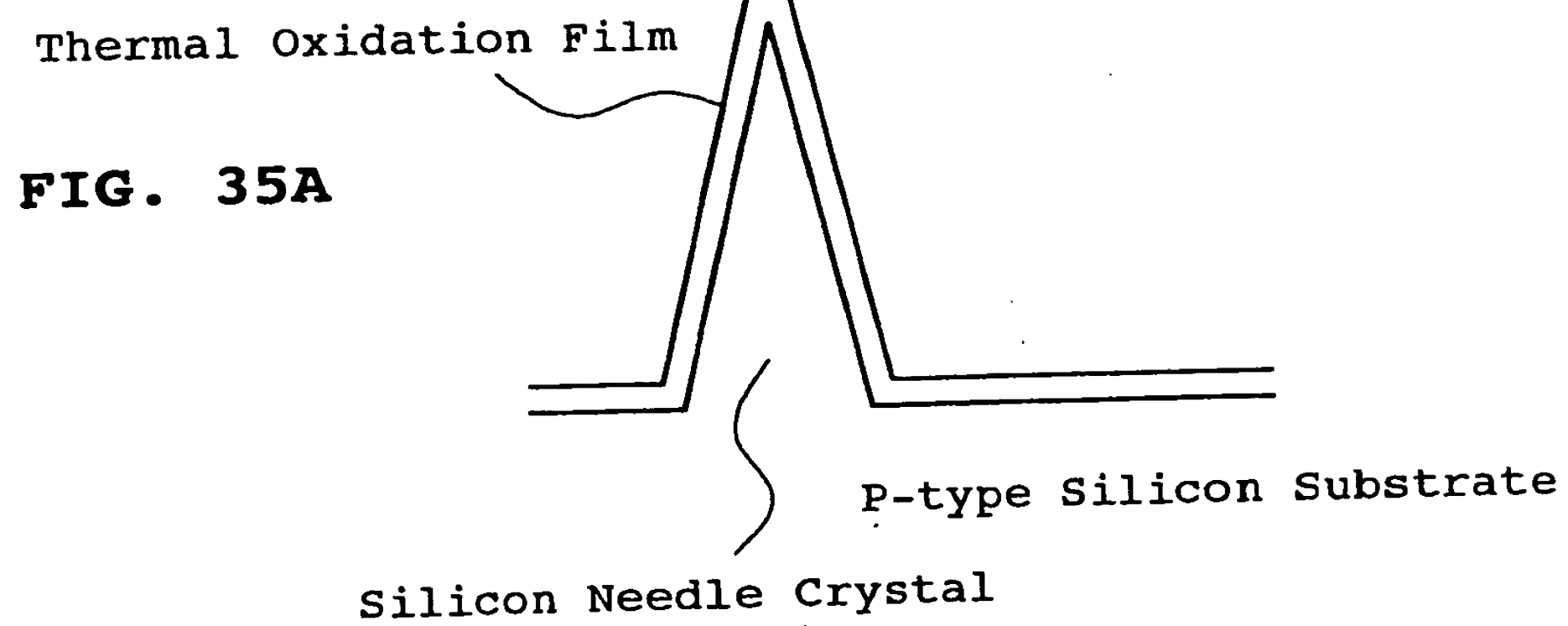
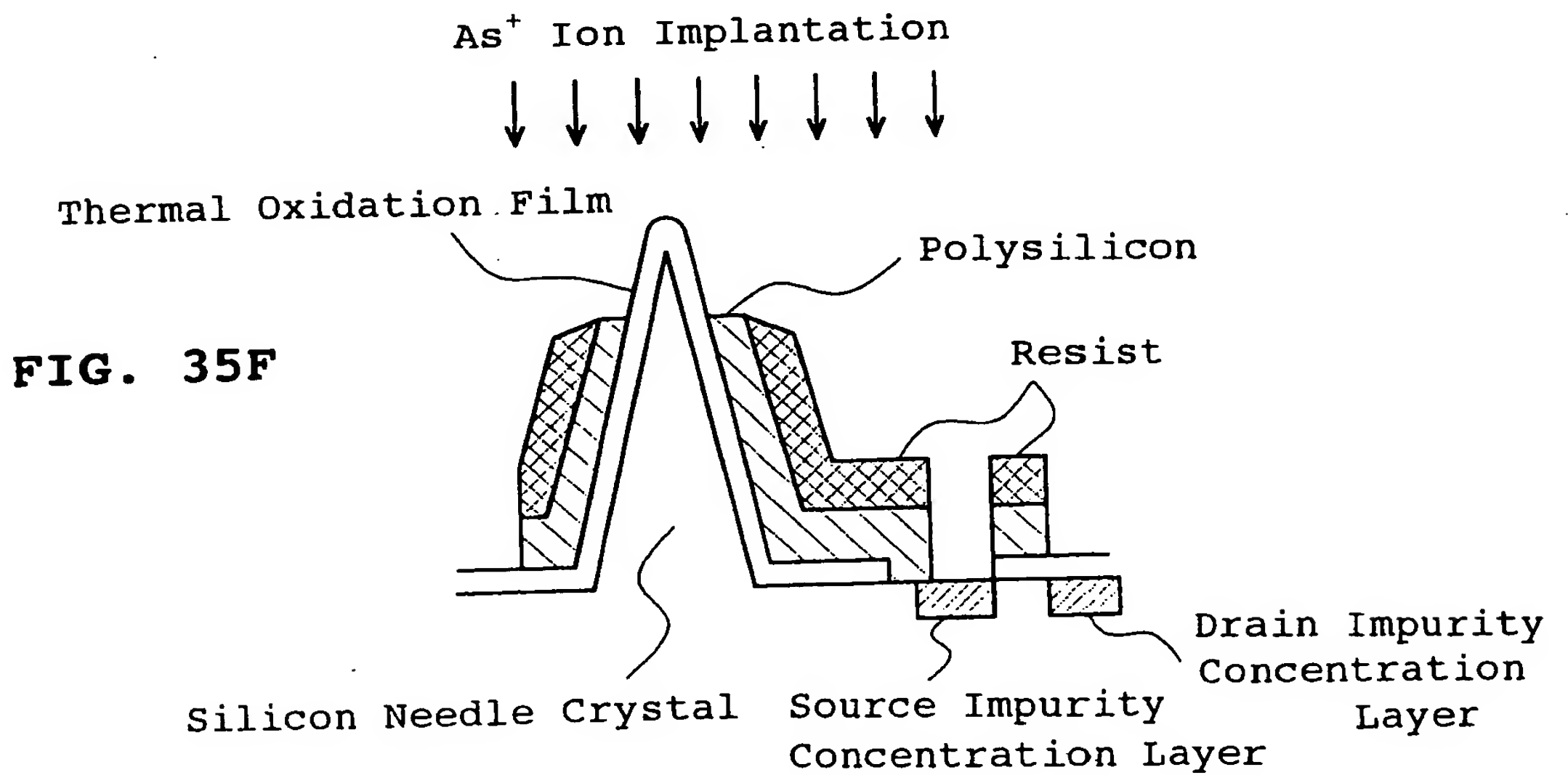
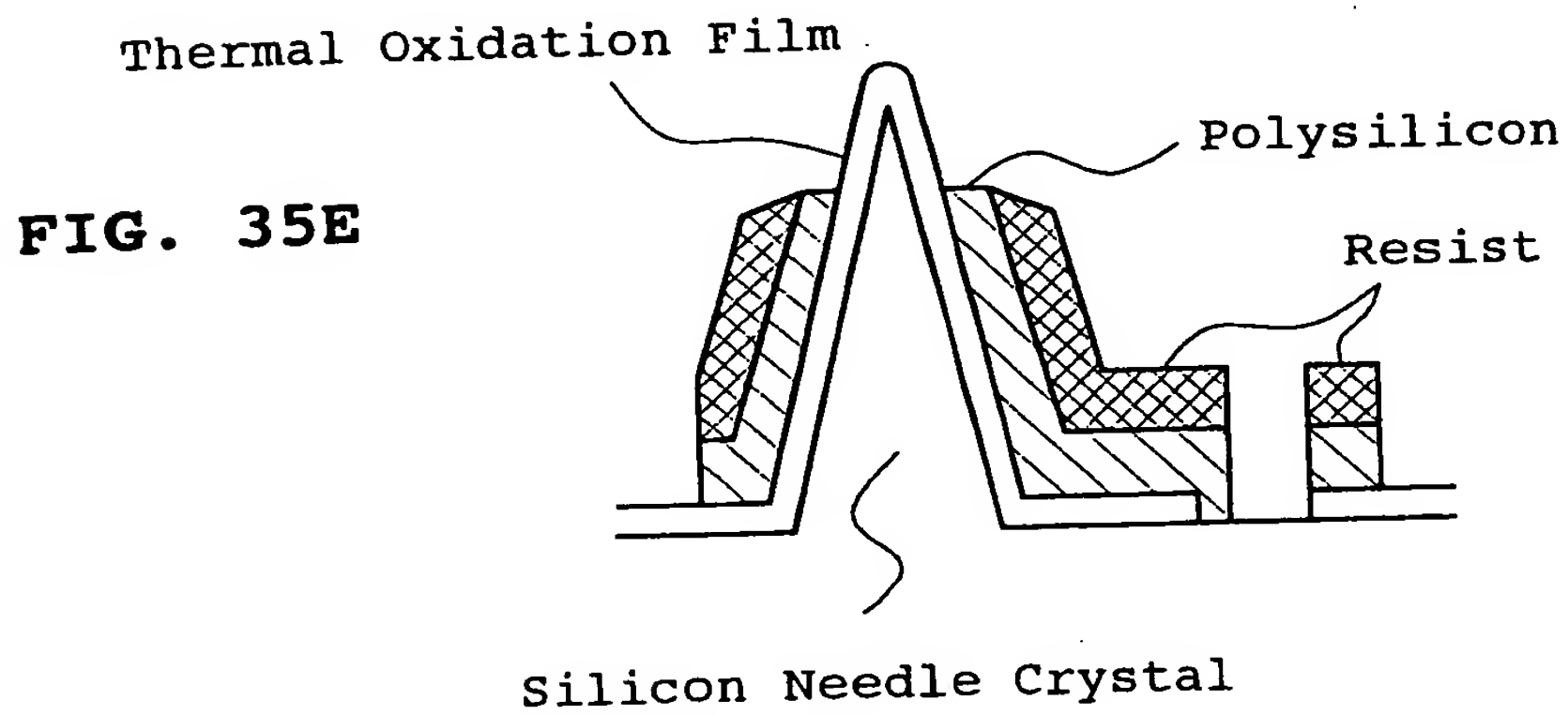
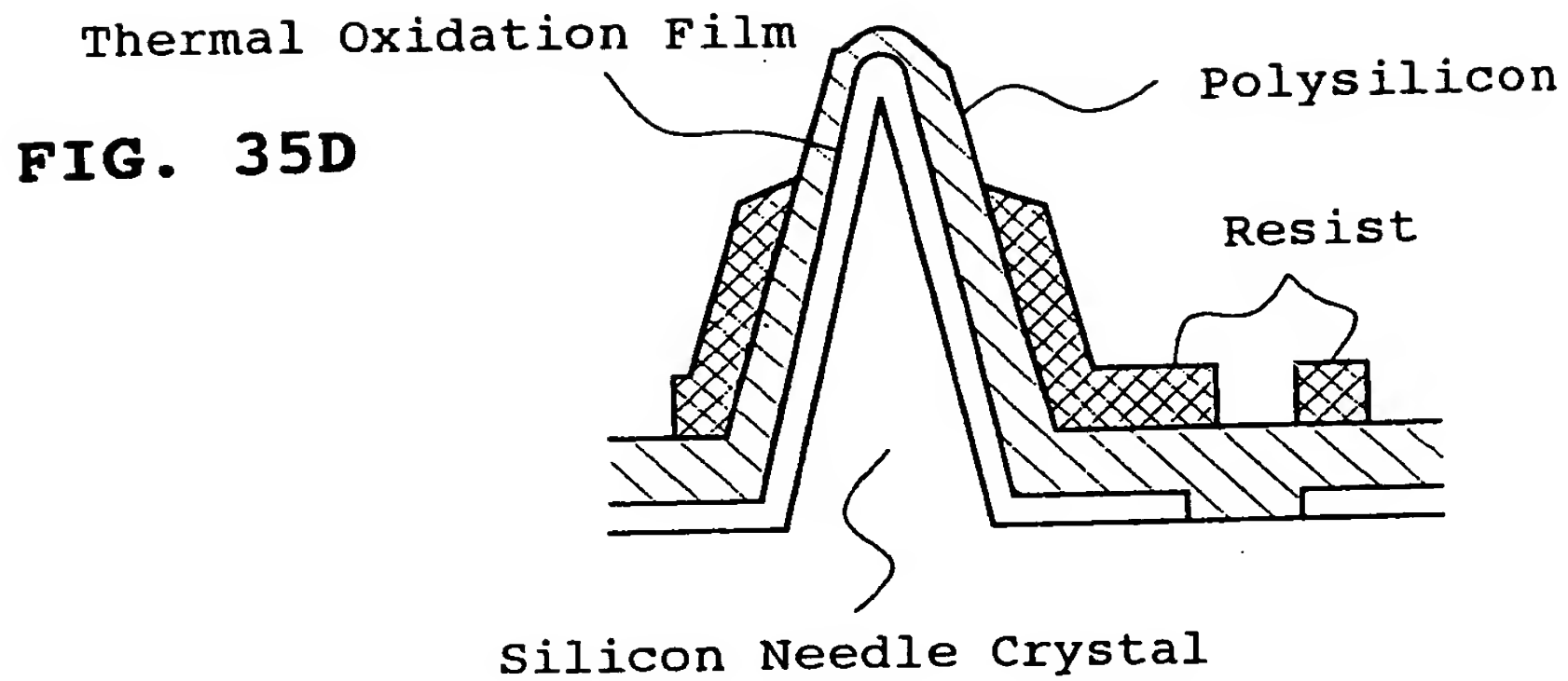
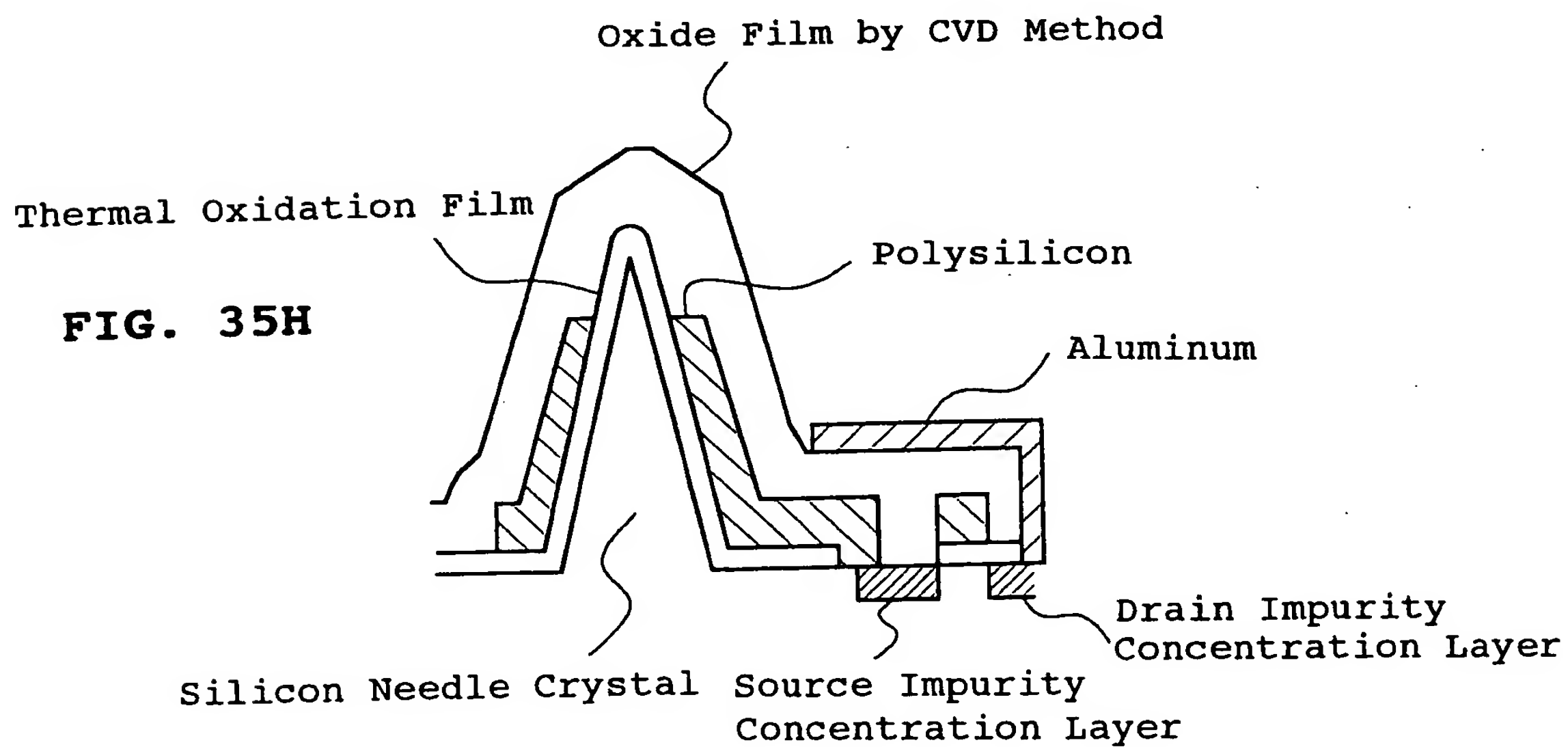
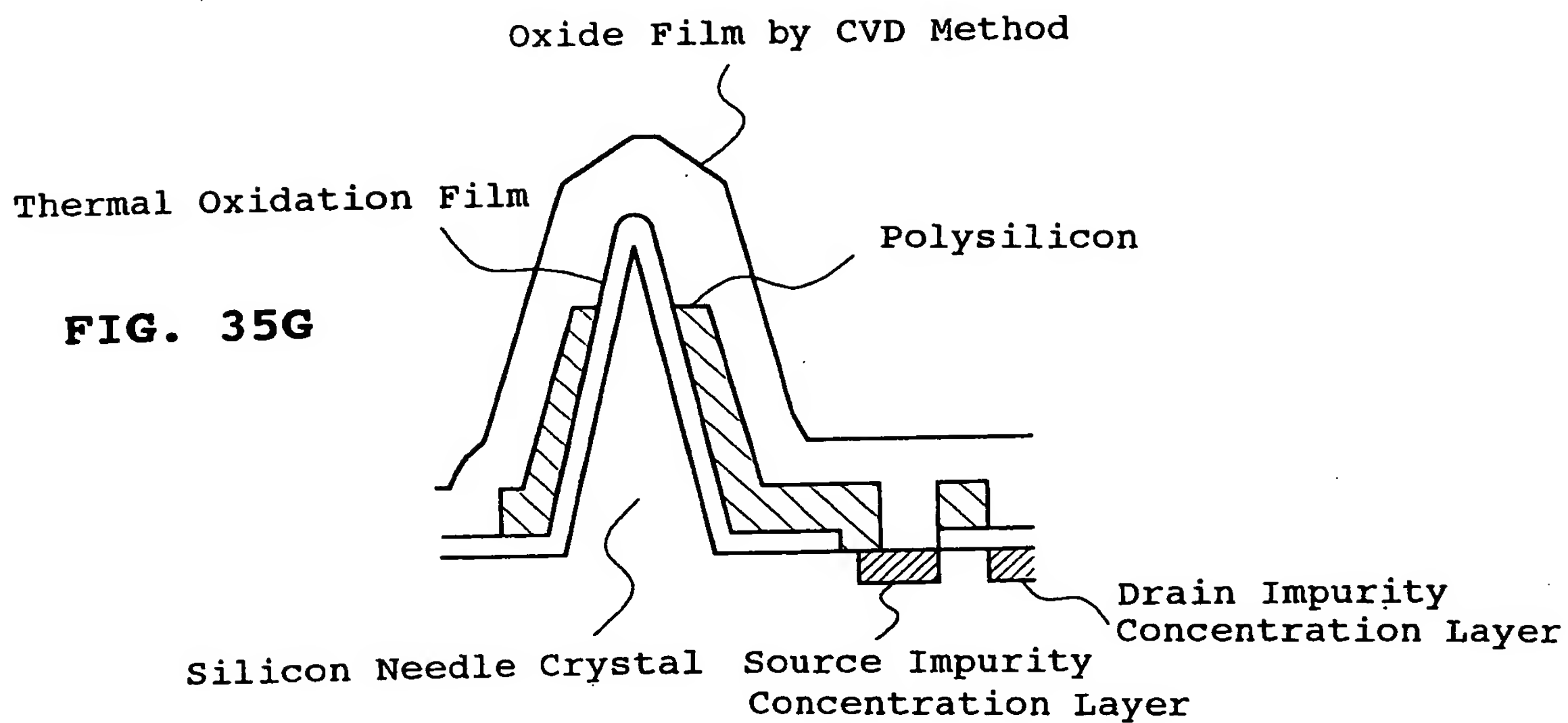


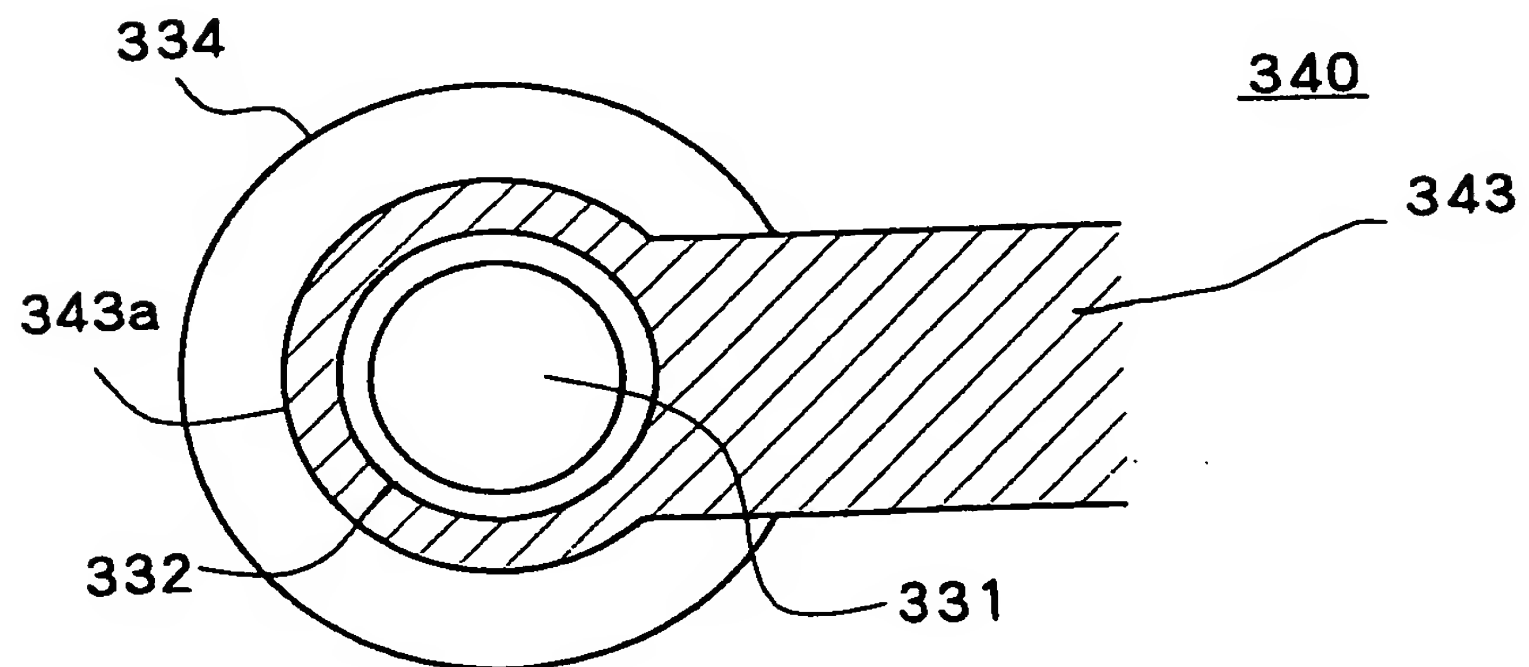
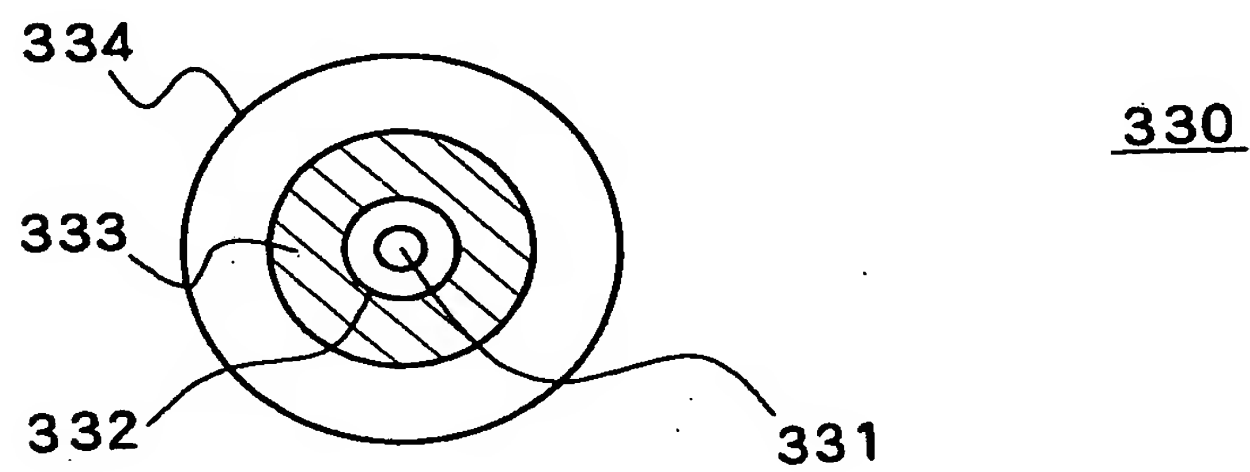
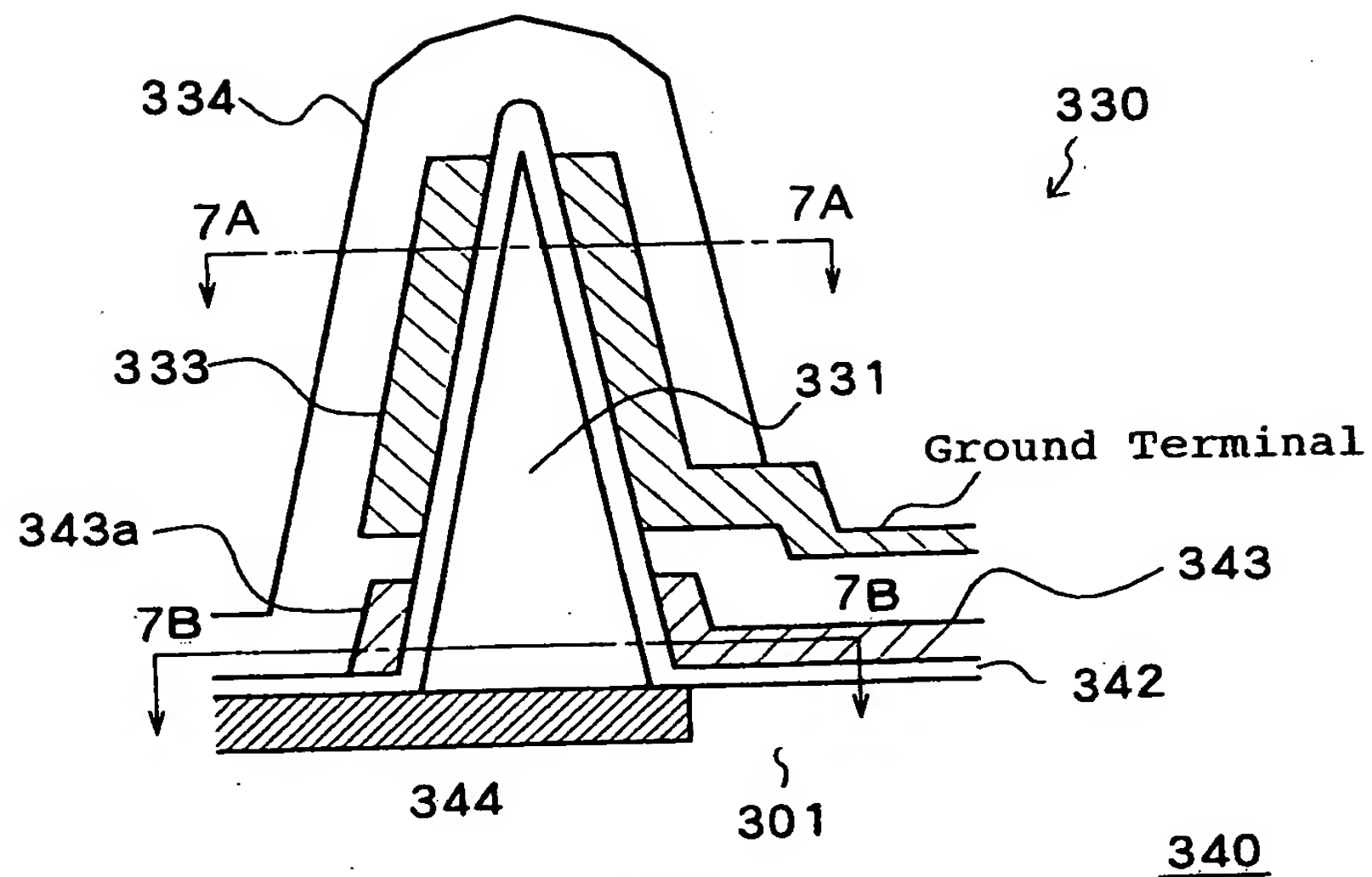
FIG. 34

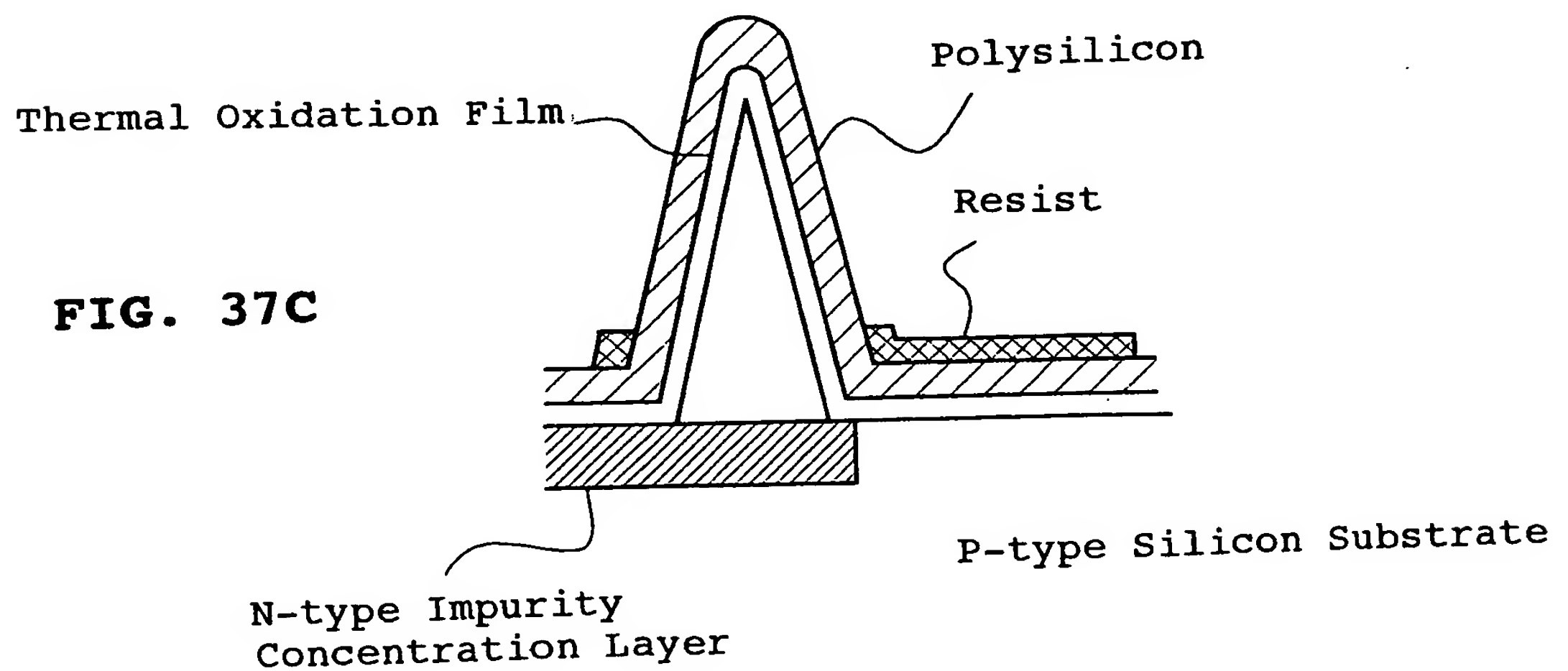
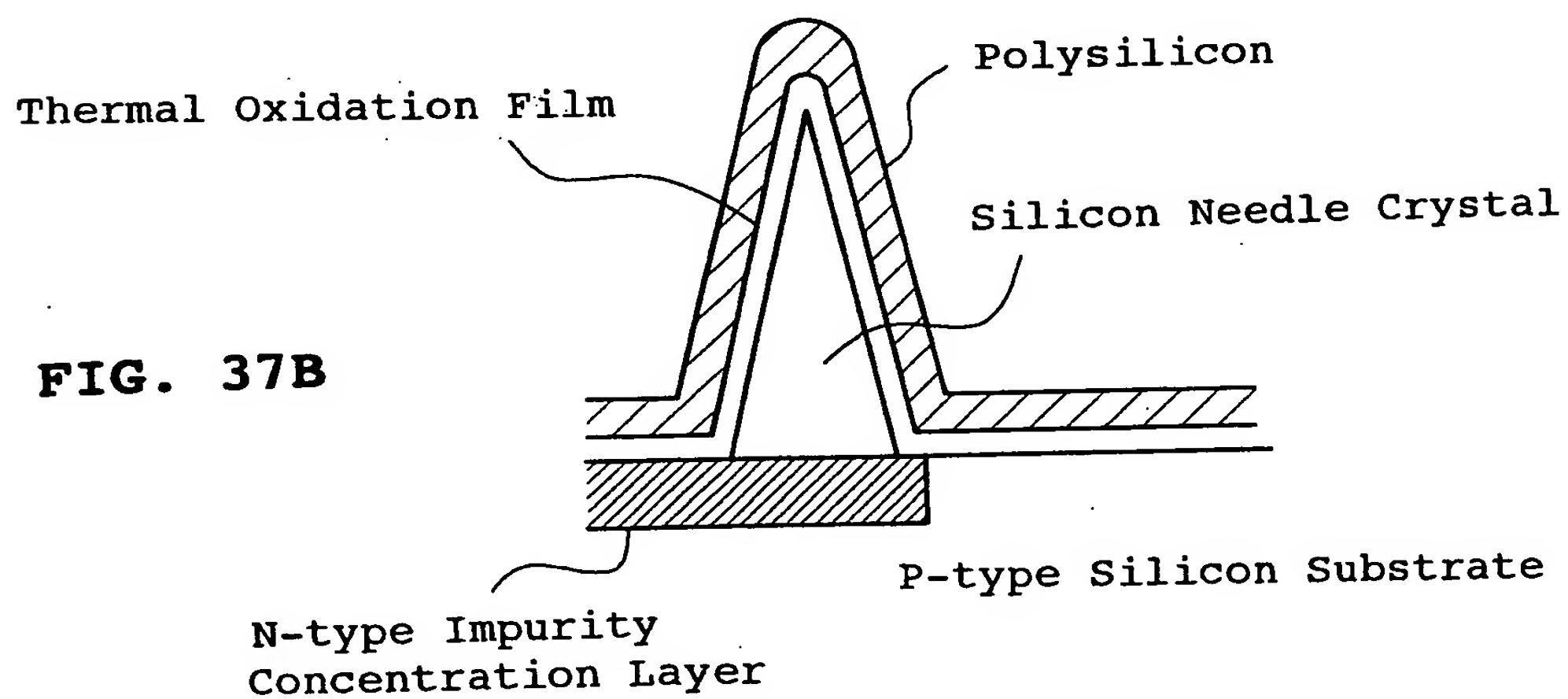
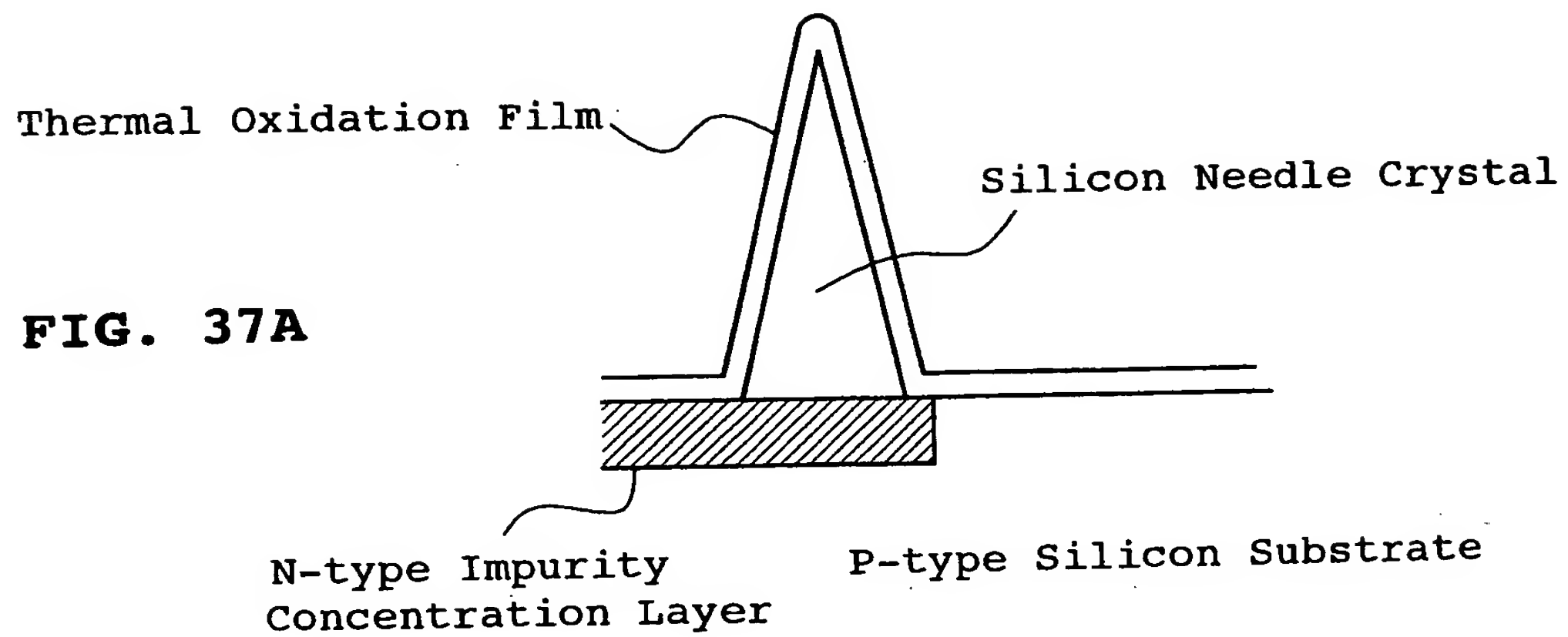


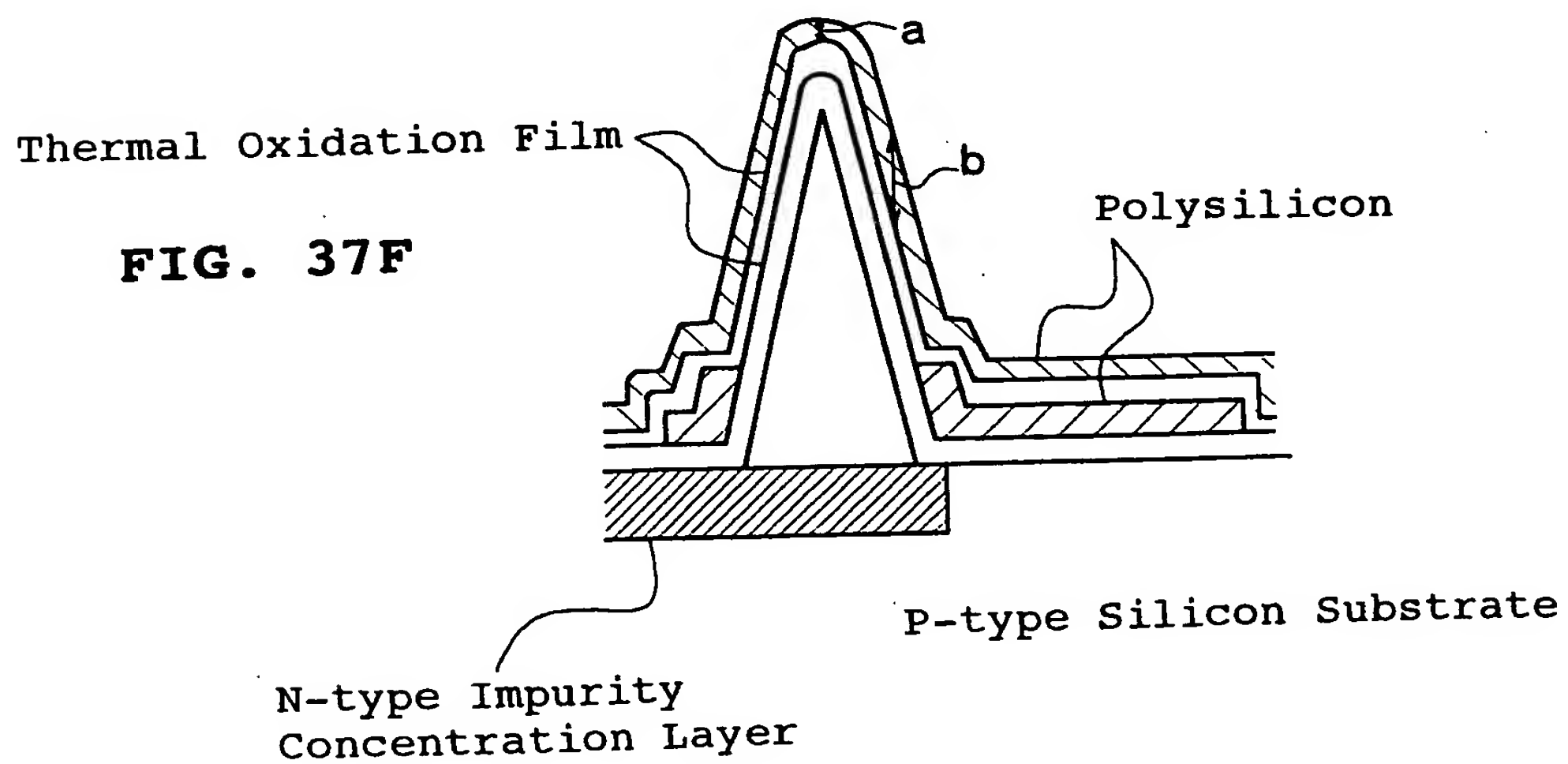
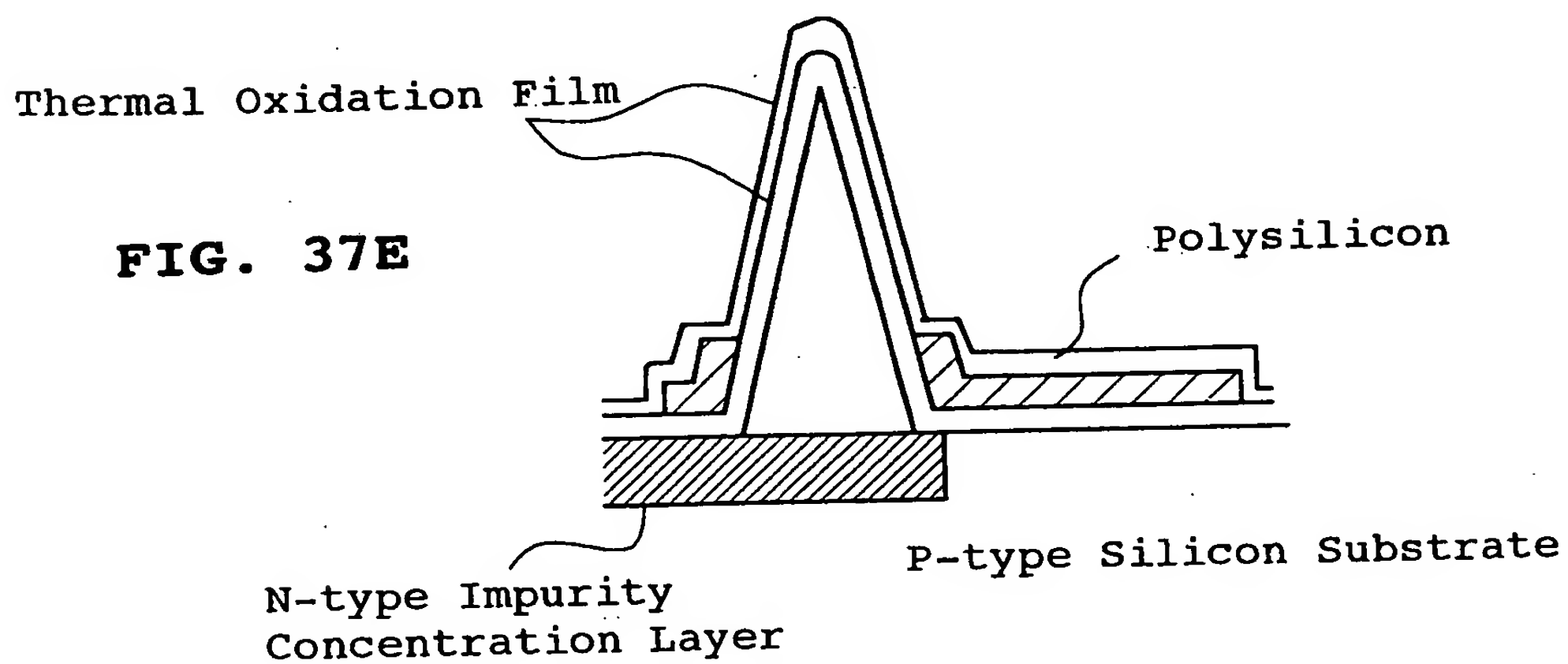
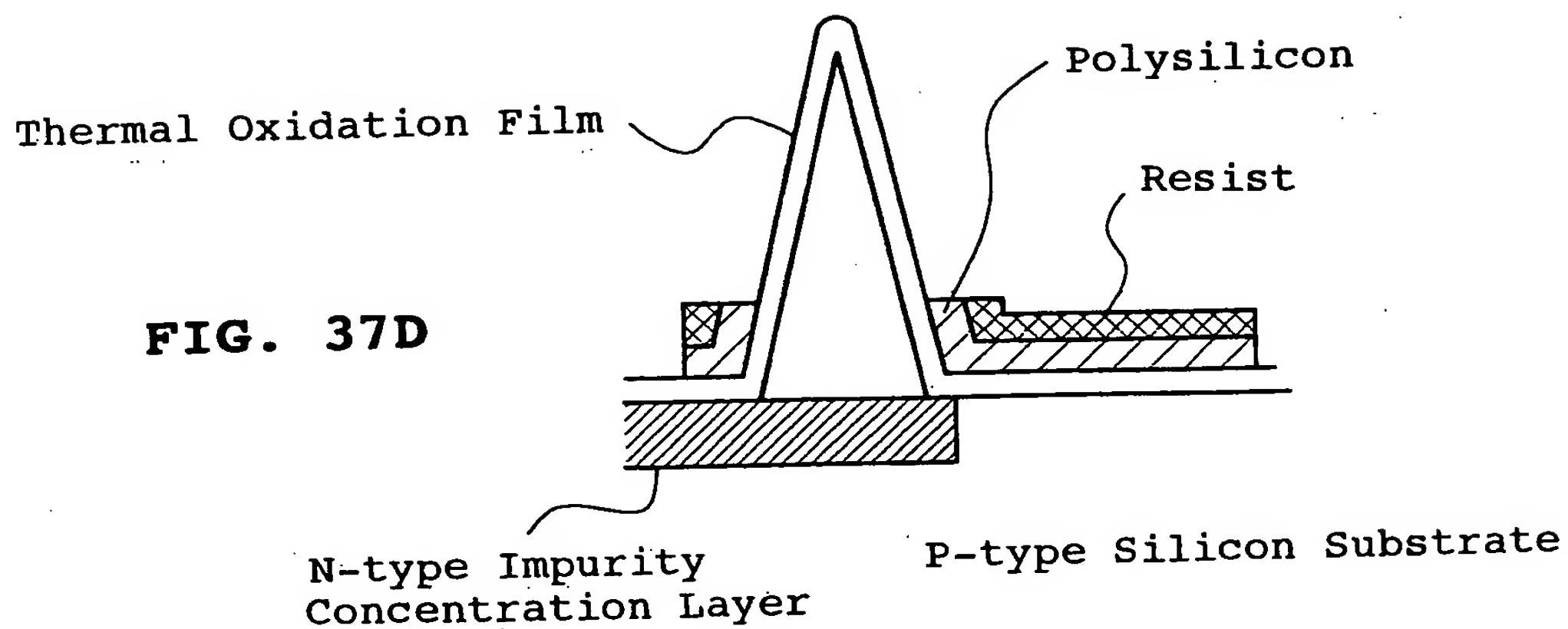






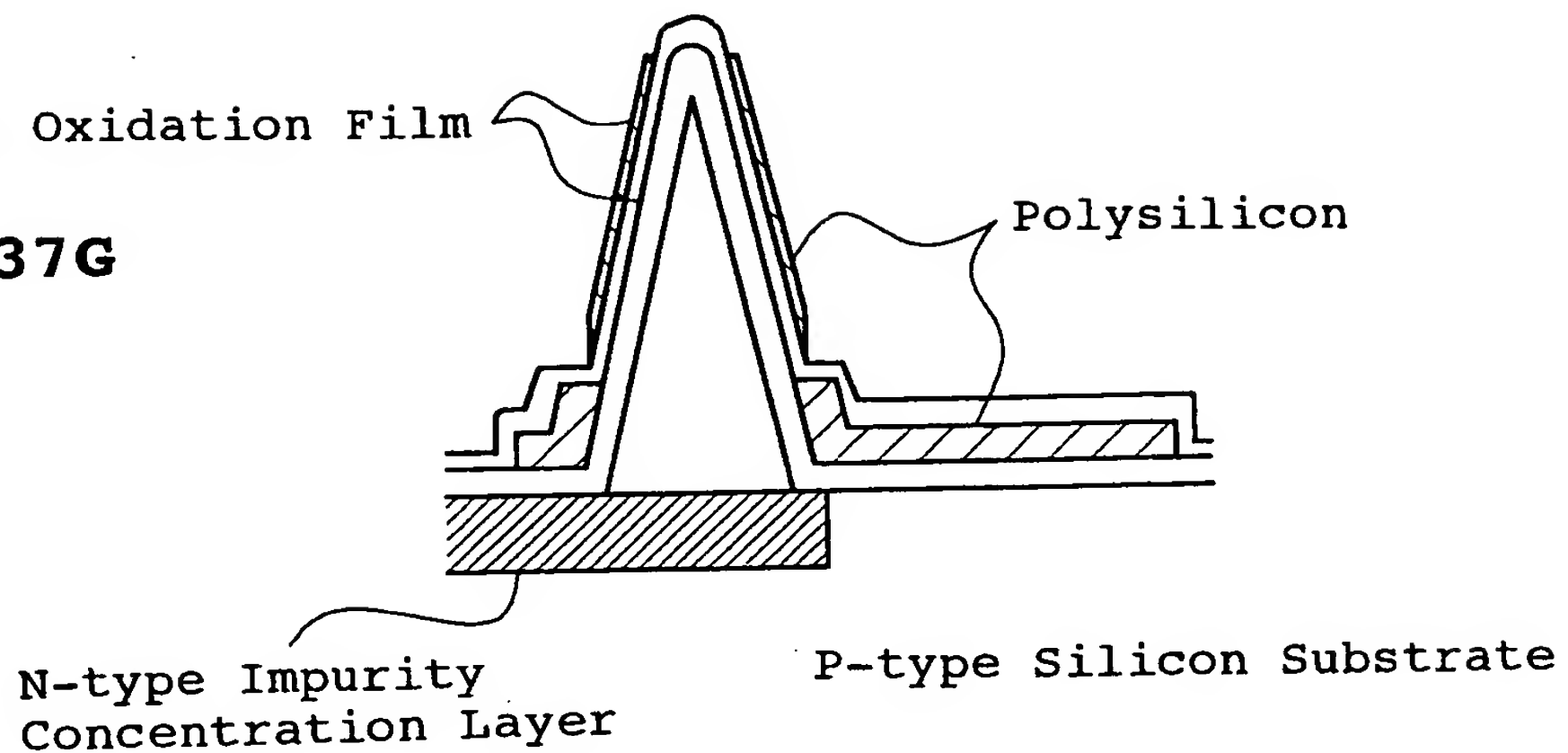






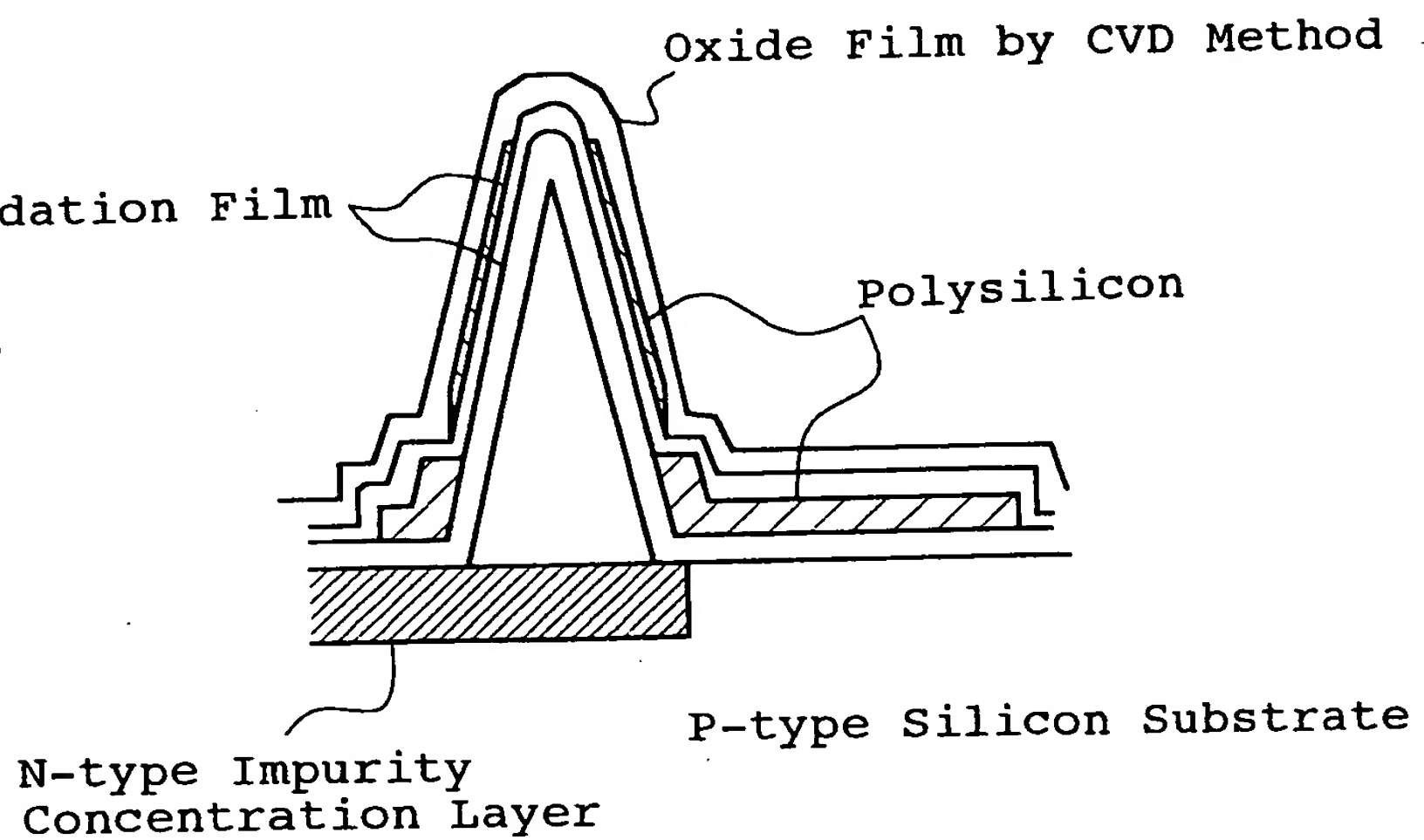
Thermal Oxidation Film

**FIG. 37G**



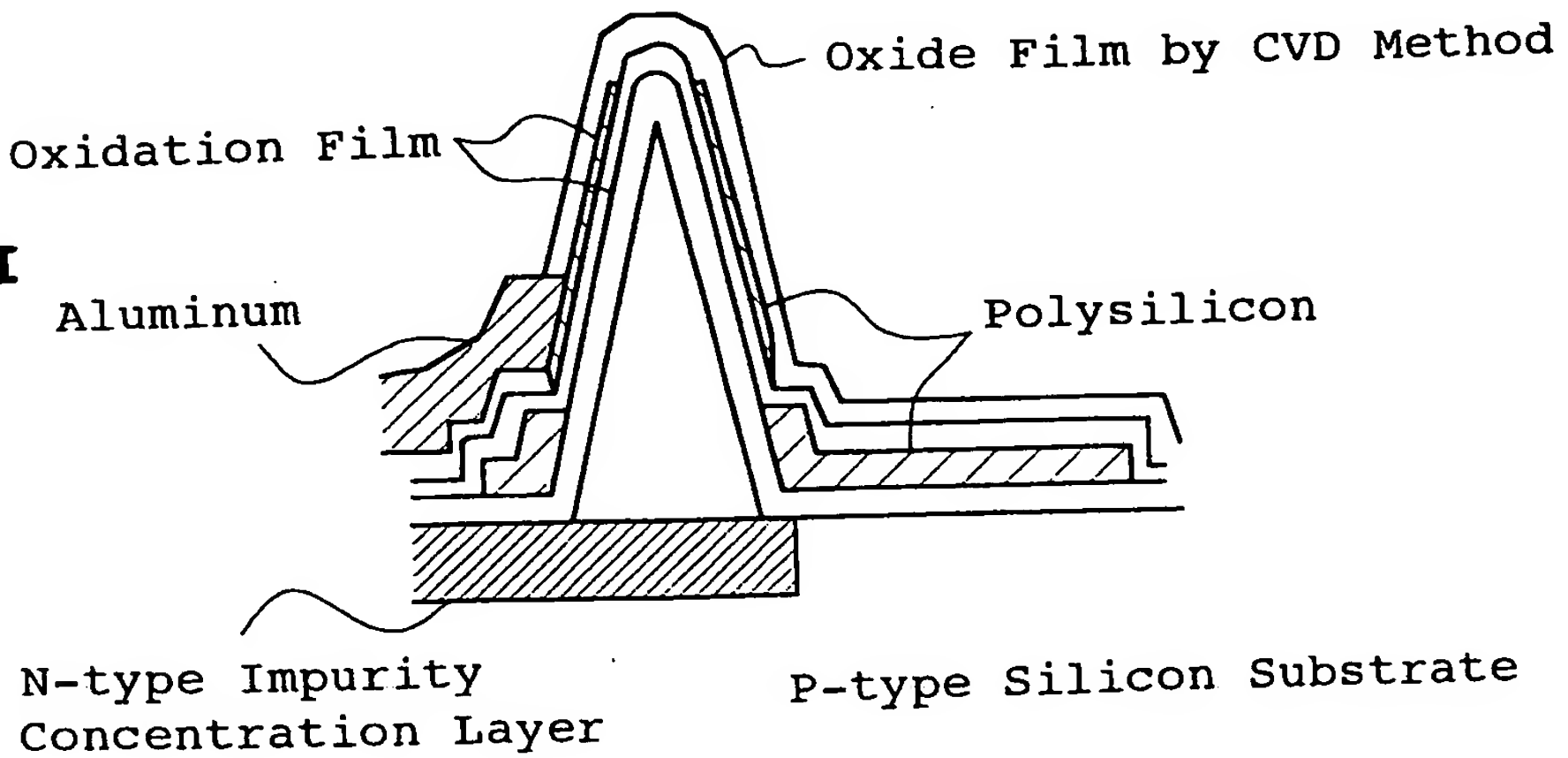
Thermal Oxidation Film

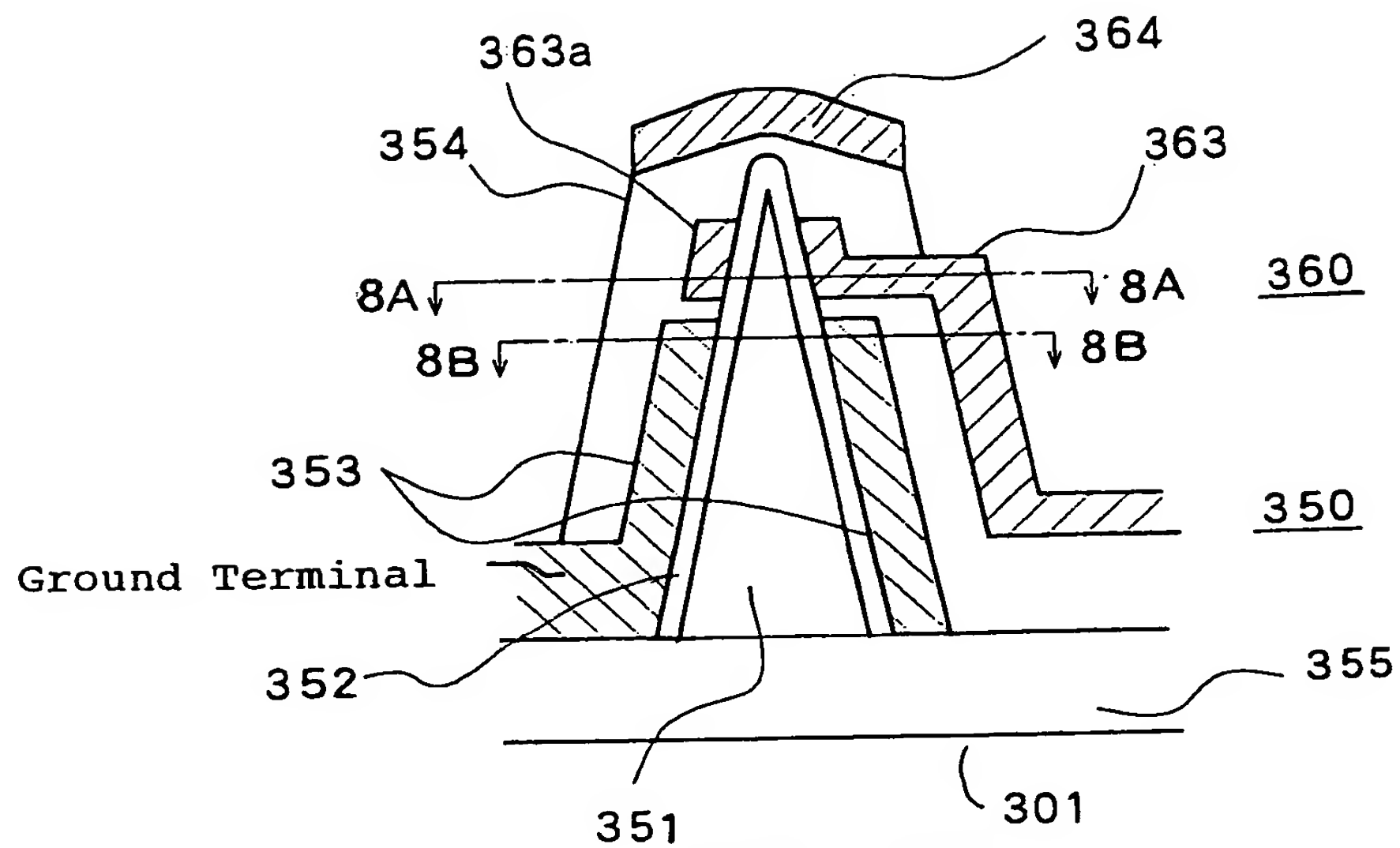
**FIG. 37H**



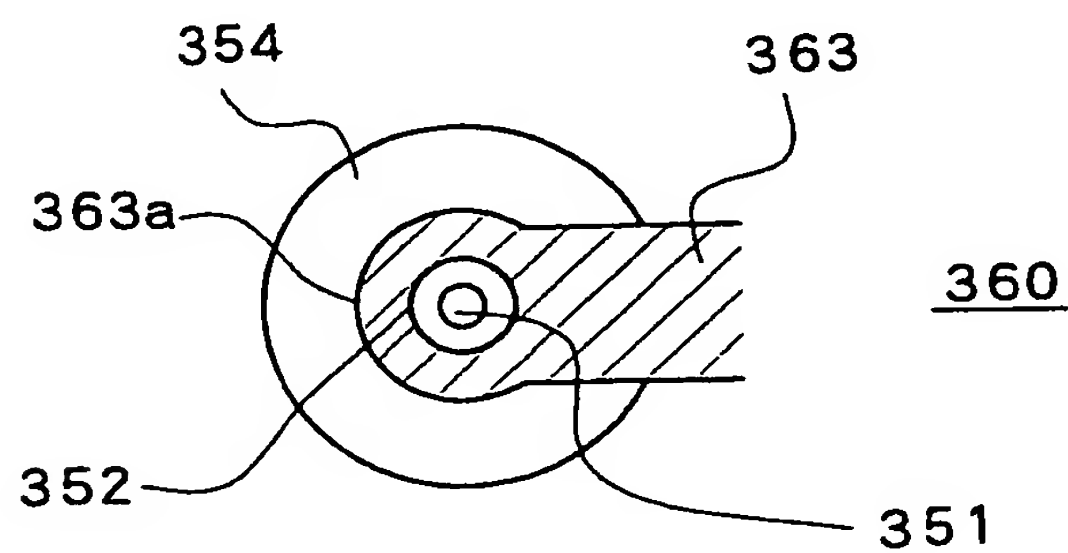
Thermal Oxidation Film

**FIG. 37I**

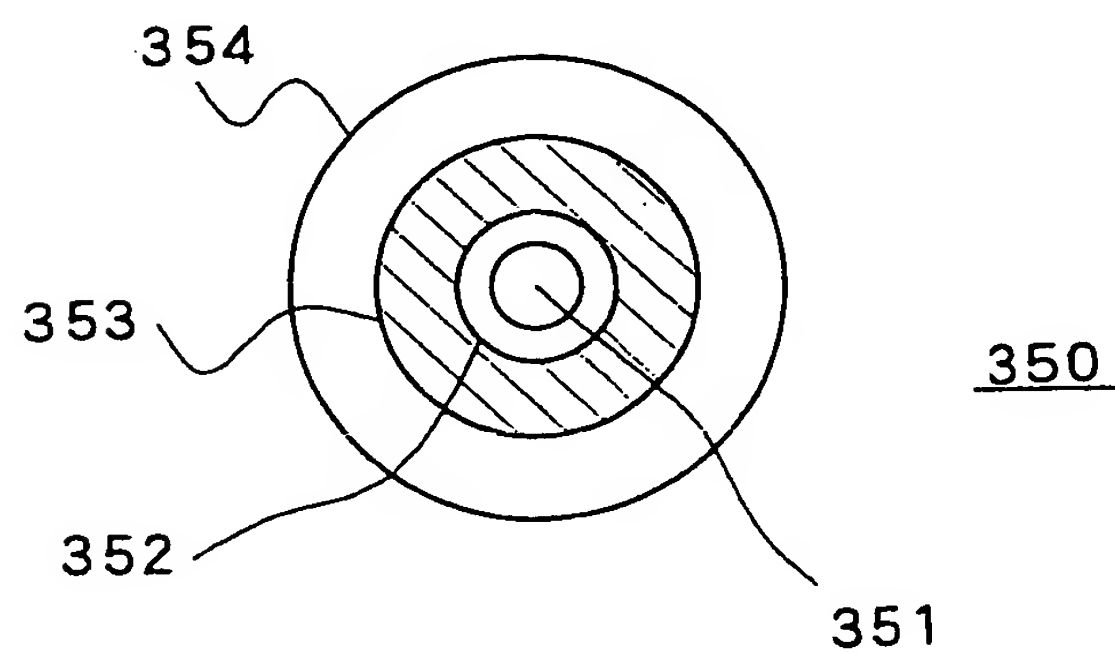




**FIG. 38A**



**FIG. 38B**



**FIG. 38C**

